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Colorado Department of Public Health and Environment

January 14, 2002

Mr. Chuck Stilwell, PE
ARCO Environmental Remediation
307 East Park Street, Suite 400
Anaconda, Montana 59711

Re: Rico-Argentine Mine Area Water Quality Assessment

Dear Mr. Stilwell:

The Colorado Department of Public Health and Environment, Water Quality Control Division, has completed your request for preliminary permit limits for the Rico-Argentine Mine area.

The assessment encompassed seven point source discharges, identified in the table below, that were located within the three miles of the Rico-Argentine Mine area. The findings of the assessment indicate that during times of low flow, there is a serious zinc water quality problem that results in the point source discharge contributions exceeding the stream's assimilative capacity for zinc by 31.6 lbs/day.

Table of Available Zinc Assimilative Capacities and Zinc Contributions	
Maximum Assimilative Loading, Background, and Facility Contributions at the 85th Percentile	***Loading in lbs/day***
Acute Maximum Assimilative Loading	4.95
Background Allocation	-0.95
St. Louis Ponds Point Source Contribution	-17.81
Blaine Adit Point Source Contribution	-8.01
Argentine Seep Point Source Contribution	-3.75
Columbia Tailings Seep Point Source Contribution	-4.81
Rico Boy Adit Point Source Contribution	-0.39
Santa Cruz Adit Point Source Contribution	-0.35
Silver Swan Adit Point Source Contribution	-0.48
Deficit	***-31.60***

Enclosed you will find a copy of the Rico-Argentine Mine area water quality assessment (WQA), which includes the detailed findings of two evaluated scenarios. These two scenarios were based on the most conservative of assumptions, and one of the scenarios includes the potential results of the recently undertaken changes at the mine area.

Usually, within a basin where water quality is limited and multiple dischargers exist, each discharger is given the opportunity to trade allocations. However, to facilitate the completion of this WQA, any downstream allocations that were required were deducted from the allocation to the St. Louis Ponds. Despite these adjustments, the findings of both scenarios indicate that, under the current circumstances, treatment must be accomplished at all locations in order to meet zinc limitations.

It should be noted that while there is some flexibility in how the water quality standards and antidegradation regulations are applied based on regulatory determinations, there is no flexibility in the determinations of the following:

- Each of the seven discharges in the previous table are point source discharges. They are not "non-point sources" as identified by ARCO in their September 21, 2001 letter.
- Each of the seven discharges must be addressed in any assessment performed for the Rico-Argentine Mine area due to the limited dilution in the area.

We look forward to discussing the WQA with you further once you have had an opportunity to review it.

Sincerely,

Susan Nachtrieb
Permits Unit Manager

Enclosure

Cc: Lee Hanley, U.S. EPA Region VIII
Chuck Stilwell, ARCO
William Kelly, SHE-ESA
Pat Nelson, CH2M HILL
Anthony Trumbly, Colorado Attorney General's Office
Annette Quill, Colorado Attorney General's Office

APPENDIX A
WATER QUALITY ASSESSMENT
TRIBUTARIES TO AND THE MAINSTEMS OF
SILVER CREEK AND THE DOLORES RIVER
RICO-ARGENTINE MINE AREA

Table A-1
Assessment Summary

Name of Facility	Rico-Argentine Mine Area
CDPS number	CO-0029793
WBID - Stream Segment COSJDO03 (St. Louis Ponds, Columbia Tailings Seep, Rico Boy Adit, Santa Cruz Adit, Silver Swan Adit)	San Juan River Basin, Dolores River Sub-basin, Stream Segment 03: Mainstem of the Dolores River from a point immediately above the confluence with Horse Creek to a point immediately above the confluence with Bear Creek.
WBID - Stream Segment COSJDO09 (Blaine Adit)	San Juan River Basin, Dolores River Sub-basin, Stream Segment 09: Mainstem of Silver Creek from a point immediately below the Town of Rico's water supply diversion to the confluence with the Dolores River.
WBID – Stream Segment COSJDO05 (Argentine Seep)	San Juan River Basin, Dolores River Sub-basin, Stream Segment 05: All tributaries to the Dolores River and West Dolores River, including all wetlands, lakes and reservoirs, from the source to a point immediately below the confluence with the West Dolores River except for specific listings in Segments 1 and 6 through 10, mainstem of Beaver Creek (including Plateau Creek) from the source to the confluence with the Dolores River.
Classifications for COSJDO03	Cold Water Aquatic Life Class 1 Class 1a Recreation Agriculture
Classifications for COSJDO09	Cold Water Aquatic Life Class 2 Class 1a Recreation (May 1 through October 31) Class 2 Recreation (November 1 through April 30) Agriculture
Classifications for COSJDO05	Cold Water Aquatic Life Class 1 Class 1a Recreation Water Supply Agriculture
Designation for COSJDO03	Undesignated
Designation for COSJDO09	Use Protected
Designation for COSJDO05	Undesignated

I. Introduction

The water quality assessment (WQA) of the Rico-Argentine Mine area was developed for the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD). The WQA was prepared to facilitate issuance of Colorado Discharge Permit System (CDPS) permits for the Rico-Argentine Mine area, and is intended to determine the water quality-based effluent limits (WQBELs) and antidegradation-based average concentrations (ADBACs) available to discharges in the Rico-Argentine Mine area for pollutants found to be of concern.

The Rico-Argentine Mine area is located near the Town of Rico. Point source discharges resulting from inactive mining and milling operations ultimately flow to the Dolores River, including discharges that ultimately flow to Silver Creek, which is a tributary to the Dolores River. Figure A-1 on the following page contains a map of the study area evaluated as part of this WQA.

Because of an inconsistent and disparate numbering system used in the identification of sampling locations by multiple entities that have sampled the Rico-Argentine Mine area over the past years, this WQA utilizes yet another numbering system as shown in Figure A-1. Specifically, this WQA uses the water body identification (WBID) number for each stream segment combined with the distance from the beginning of the stream segment. This numbering system is used to identify the ambient water quality sampling locations and the confluence locations of the discharges of concern.

This WQA was developed to address point source discharges including the following:

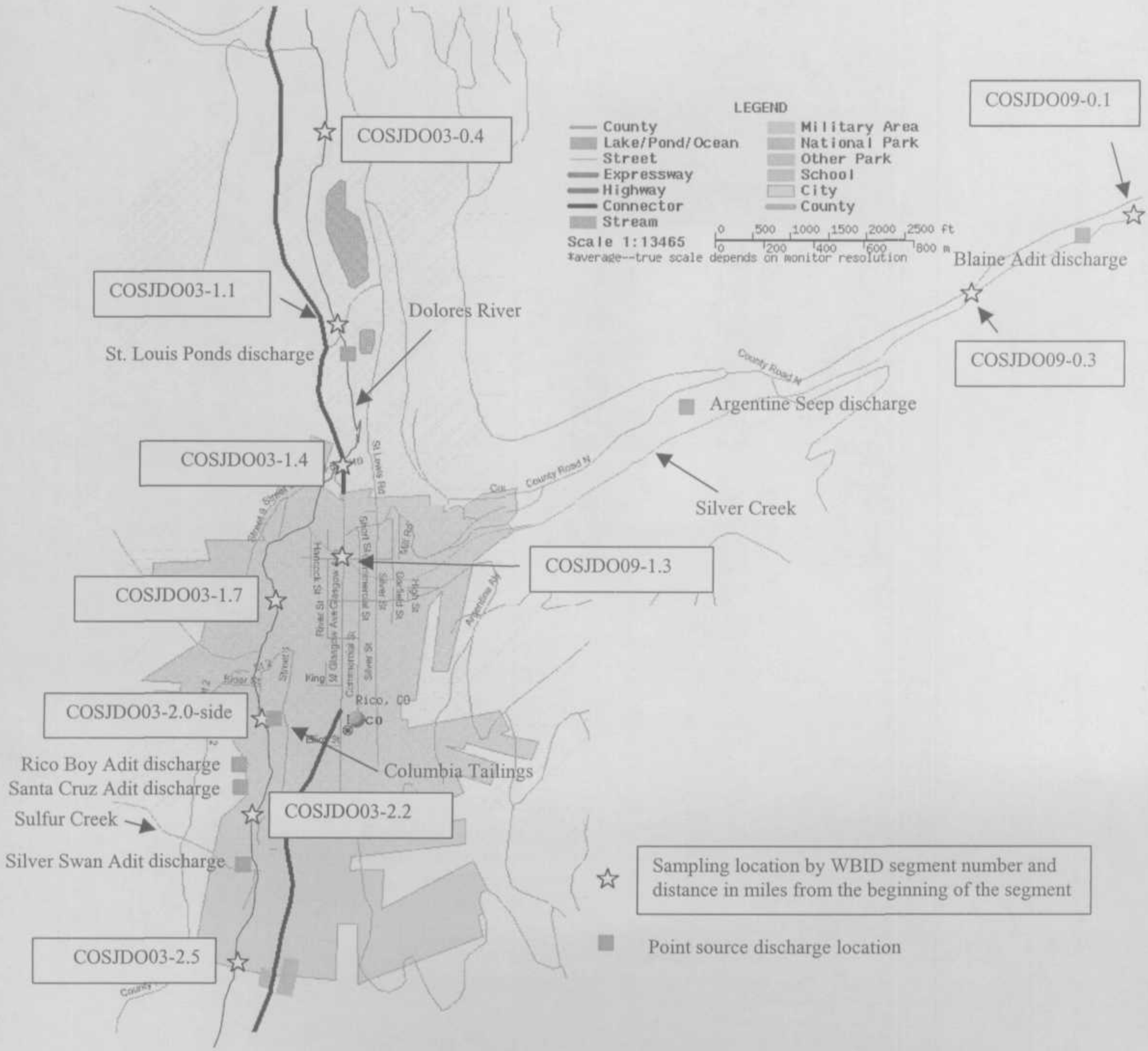
- The Blaine Adit which discharges to the mainstem of Silver Creek
- The Argentine Seep which discharges to a tributary to Silver Creek
- The St. Louis Adit, which combines with surface runoff and is routed through a series of 11 settling ponds that ultimately discharge to the mainstem of the Dolores River (hereinafter known as the St. Louis Ponds).
- The Columbia Tailings Seep which discharges to a side channel of the Dolores River
- The Santa Cruz Adit, Rico Boy Adit, and Silver Swan Adit, which discharge to wetlands that then drain to the mainstem of the Dolores River.

These seven point source discharges are located within three river miles of each other. During low flow conditions, the incremental increase in flow in these three river miles is only 3 cfs and facility contributions compose more than ½ of this amount. Thus, modeling of these point sources together was necessary.

It is standard WQCD procedure to limit the scope of WQAs to determine assimilative capacities for discharges that consist of mine water (e.g., adits, spoil springs, and seeps). Discharges consisting entirely of surface runoff are excluded when conducting evaluations because these discharges only occur during times of rainfall events when non-low flow conditions exist. Thus, discharges consisting entirely of contaminated storm water runoff are not evaluated as part of this assessment.

It should be noted that several discharges consist of a combination of surface runoff and mine water. The WQA therefore determines assimilative capacities for the combined surface runoff and mine

Figure A-1
Study Area



water discharge as it would be impractical to account for mine discharges without assessing the surface runoff flow and its associated constituents that are commingled prior to discharge.

To facilitate the development of this WQA, various scenarios were analyzed to ensure that changes planned at the Rico-Argentine Mine area were assessed. This report is limited to the following two scenarios as they are the most conservative:

- **Scenario 1:** Consideration of all point source discharges including the Blaine Adit, the Argentine Seep, the St. Louis Pond System, the Columbia Tailing Ponds Seep, the Rico Boy Adit, the Santa Cruz Adit and the Silver Swan Adit, with consideration of the seepage and the hydrological connection between St. Louis Ponds System and the Dolores River. A reduced waste load for some parameters at the St. Louis Ponds System was required.
- **Scenario 2**: Consideration of point source discharges including the Argentine Seep, the St. Louis Pond System, the Columbia Tailing Ponds Seep, the Rico Boy Adit, the Santa Cruz Adit and the Silver Swan Adit. This scenario assumes the effective sealing of the Blaine Adit and the elimination of the seepage and the hydrological connection between St. Louis Ponds System and the Dolores River. A reduced waste load for some parameters at the St. Louis Ponds System was required.

Each scenario involved calculations based on the upcoming changes to the *Classifications and Numeric Standards for San Juan River and Dolores River Basins, Regulation 34,* which will become effective on February 20, 2002. These standards will incorporate the newly promulgated equations for the calculation of in-stream metals standards and will also incorporate the changes to the segment classifications and segment-specific standards that were recently approved by the Water Quality Control Commission (WQCC). Each scenario follows the procedures set forth in the *Antidegradation Significance Determination for New or Increased Discharges, Procedural Guidance* (hereinafter AD guidance) recently approved by the WQCC. This WQA does not incorporate draft guidance for the development of mixing zones.

The findings of the WQA indicate that during times of receiving stream low flow, point sources discharge 31.6 lbs/day of zinc over that which can be assimilated by the Dolores River. Contributions based on the average flow and the 85th percentile concentrations are set forth in Table A-2.

Table A-2
Deficit for Zinc During Times of Low Flow

Maximum Zinc Assimilative Loading and Current Zinc Contributions	*Loading in lbs/day*
Acute Maximum Assimilative Load in the Dolores River at the Silver Swan Adit	4.95
Allocation for Background Contributions	-0.95
St. Louis Ponds Contribution	-17.81
Blaine Adit Contribution	-8.01
Argentine Seep Contribution	-3.75
Columbia Tailings Seep Contribution	-4.81
Rico Boy Adit Contribution	-0.39
Santa Cruz Adit Contribution	-0.35
Silver Swan Adit Contribution	-0.48

	Deficit	***-31.6***

Information used in this assessment includes data gathered from the Atlantic Richfield Company (ARCO) and its consultants, the Town of Rico, the Department of the Interior, the WQCD, the Colorado Division of Water Resources (DWR), the U.S. Environmental Protection Agency (EPA), the U. S. Geological Survey (USGS), and the local water commissioner. The data used in the assessment consist of the best information available at the time of preparation of this WQA package.

II. Water Quality

The St. Louis Ponds System discharges to the WBID stream segment COSJDO03, which means the San Juan River Basin, Dolores River Sub-basin, Stream Segment 03. This segment is composed of the "Mainstem of the Dolores River from a point immediately above the confluence with Horse Creek to a point immediately above the confluence with Bear Creek." Stream segment COSJDO03 is classified for Cold Water Aquatic Life Class 1, Class 1a Recreation, and Agriculture.

The Rico Boy Adit and Santa Cruz Adit are located nearby to one another and both discharge to wetlands that drain to the Dolores River. The Silver Swan Adit also discharges to wetlands that drain to the Dolores River. The discharge locations of these adits are currently classified as tributary wetlands. Tributary wetlands include the headwaters of surface waters or wetlands within the floodplain. For tributary wetlands, it is the WQCD's approach that the classifications adopted for the segment into which the wetlands fall will apply. For that reason, the Rico Boy, Santa Cruz, and Silver Swan Adit were considered subject to the standards for stream segment COSJDO03. The standards in Table A-3 will be assigned to stream segment COSJDO03 in accordance with the *Classifications and Numeric Standards for San Juan River and Dolores River Basins*.

The Blaine Adit discharges to the WBID stream segment COSJDO09, which means the San Juan River Basin, Dolores River Sub-basin, Stream Segment 09. This segment is composed of the "Mainstem of Silver Creek from a point immediately below the Town of Rico's water supply diversion to the confluence with the Dolores River." Stream segment COSJDO09 is classified for Cold Water Aquatic Life Class 2, Class 1a Recreation (May 1 through October 31) and Class 2 Recreation (November 1 through April 30), and Agriculture. The standards in Table A-4 will be assigned to stream segment COSJDO09 in accordance with the *Classifications and Numeric Standards for San Juan River and Dolores River Basins*.

The Argentine Seep discharges to an unnamed tributary to Silver Creek. This unnamed tributary to Silver Creek is determined to be WBID stream segment COSJDO05, which means the San Juan River Basin, Dolores River Sub-basin, Stream Segment 05. This segment is composed of "All tributaries to the Dolores River and West Dolores River, including all wetlands, lakes and reservoirs, from the source to a point immediately below the confluence with the West Dolores River except for specific listings in Segments 1 and 6 through 10, mainstem of Beaver Creek (including Plateau Creek) from the source to the confluence with the Dolores River." Stream segment COSJDO05 is classified for Cold Water Aquatic Life Class 1, Class 1a Recreation, Water Supply and Agriculture.

The standards in Table A-5 will be assigned to stream segment COSJDO05 in accordance with the *Classifications and Numeric Standards for San Juan River and Dolores River Basins.*

Table A-3 **In-stream Standards for Stream Segment COSJDO03**
Physical and Biological
Dissolved Oxygen (DO) = 6 mg/l, minimum
Dissolved Oxygen (DO) = 7 mg/l, minimum (during spawning)
pH = 6.5 - 9 su
Fecal Coliform = 200 colonies/100 ml
Inorganic
Un-ionized ammonia acute = TVS
Un-ionized ammonia chronic = 0.02 mg/l
Chlorine acute = 0.019 mg/l
Chlorine chronic = 0.011 mg/l
Free Cyanide acute = 0.005 mg/l
Sulfide chronic = 0.002 mg/l
Boron chronic = 0.75 mg/l
Nitrite = 0.05 mg/l
Metals
Total Recoverable Arsenic chronic = 100 ug/l
Dissolved Cadmium acute and chronic = TVS
Total Recoverable Trivalent Chromium chronic = 100 ug/l
Dissolved Hexavalent Chromium acute and chronic = TVS
Dissolved Copper acute and chronic = TVS
Total Recoverable Iron chronic = 1000 ug/l
Dissolved Lead acute and chronic = TVS
Dissolved Manganese acute and chronic = TVS
Total Mercury chronic = 0.01 ug/l
Dissolved Nickel acute and chronic = TVS
Dissolved Selenium acute and chronic = TVS
Dissolved Silver acute and chronic = TVS
Dissolved Zinc acute and chronic = TVS

Table A-4 In-stream Standards for Stream Segment COSJDO09
Physical and Biological
Dissolved Oxygen (DO) = 6 mg/l, minimum
Dissolved Oxygen (DO) = 7 mg/l, minimum (during spawning)
pH = 6.5 - 9 su
Fecal Coliform = 200 colonies/100 ml (May-Oct), 2000 colonies/100 ml (Nov-Apr)
Inorganic
Un-ionized ammonia acute = TVS
Un-ionized ammonia chronic = 0.02 mg/l
Chlorine acute = 0.019 mg/l
Chlorine chronic = 0.011 mg/l
Free Cyanide acute = 0.005 mg/l
Sulfide chronic = 0.002 mg/l
Boron chronic = 0.75 mg/l
Nitrite = 0.05 mg/l
Metals
Total Recoverable Arsenic chronic = 100 ug/l
Dissolved Cadmium acute = TVS
Dissolved Cadmium acute for trout and chronic = TVS
Total Recoverable Trivalent Chromium chronic = 100 ug/l
Dissolved Hexavalent Chromium acute and chronic = TVS
Dissolved Copper acute and chronic = TVS
Dissolved Lead acute and chronic = TVS
Dissolved Manganese acute and chronic = TVS
Total Mercury chronic = 0.01 ug/l
Dissolved Nickel acute and chronic = TVS
Dissolved Selenium acute and chronic = TVS
Dissolved Silver acute and chronic for trout = TVS
Dissolved Zinc chronic = 670 ug/l

Table A-5 In-stream Standards for Stream Segment COSJDO05
Physical and Biological
Dissolved Oxygen (DO) = 6 mg/l, minimum
Dissolved Oxygen (DO) = 7 mg/l, minimum (during spawning)
pH = 6.5 - 9 su
Fecal Coliform = 200 colonies/100 ml
Inorganic
Un-ionized ammonia acute = TVS
Un-ionized ammonia chronic = 0.02 mg/l
Chlorine acute = 0.019 mg/l
Chlorine chronic = 0.011 mg/l
Free Cyanide acute = 0.005 mg/l
Sulfide chronic = 0.002 mg/l
Boron chronic = 0.75 mg/l
Nitrite = 0.05 mg/l
Nitrate = 10 mg/l
Chloride = 250 mg/l
Sulfate = 250 mg/l
Metals
Total Recoverable Arsenic acute = 50 ug/l
Dissolved Cadmium acute for trout and Dissolved Cadmium chronic = TVS
Total Recoverable Trivalent Chromium acute = 50 ug/l
Dissolved Hexavalent Chromium acute and chronic = TVS
Dissolved Copper acute and chronic = TVS
Dissolved Iron chronic = 300 ug/l
Total Recoverable Iron chronic = 1000 ug/l
Dissolved Lead acute and chronic = TVS
Dissolved Manganese acute and chronic = TVS
Total Mercury chronic = 0.01 ug/l
Dissolved Nickel acute and chronic = TVS
Dissolved Selenium acute and chronic = TVS
Dissolved Silver acute and Dissolved Silver chronic for trout = TVS
Dissolved Zinc acute and chronic = TVS

Numeric standards are developed on a basin-specific basis and are adopted for particular stream segments by the WQCC. To simplify the listing of the segment-specific standards, many of the aquatic life standards are contained in a table at the beginning of each chapter of the regulations. Standards for metals are generally shown in the regulations as Table Value Standards (TVS), and these often must be derived from equations that depend on the receiving stream hardness or species of fish present. The Classifications and Numeric Standards documents for each basin include a specification for appropriate hardness values to be used. Specifically, the regulations state that:

> The hardness values used in calculating the appropriate metal standard should be based on the lower 95% confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site-specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not appropriate, a site-specific method should be used.

Hardness data for Silver Creek and the Dolores River near the points of discharge were insufficient to conduct a regression analysis based on the low flow. Therefore, the WQCD's alternative approach to calculating hardness was used, which involves computing a mean hardness. The mean hardness was computed as follows:

- Dolores River at the St. Louis Ponds: 171 mg/l as $CaCO_3$ based on Dolores River sampling data downstream from the St. Louis Ponds at sampling location COSJDO03-1.4. Data were evaluated for a period of record from April 1998 through June 2000.
- Silver Creek at the Blaine Adit: 84 mg/l as $CaCO_3$ based on Silver Creek sampling data downstream from the Blaine Adit at sampling location COSJDO09-0.3. Data were evaluated for a period of record from October 1999 through June 2000.
- Silver Creek at the tributary containing the Argentine Seep: 213 mg/l as $CaCO_3$ based on Silver Creek sampling data downstream from the confluence of the tributary containing the Argentine Seep at sampling location COSJDO09-1.3 Data were evaluated for a period of record from October 1996 through July 1999.
- Dolores River after the Columbia Tailings Seep and the Rico Boy, Santa Cruz, and Silver Swan Adits: 166 mg/l as $CaCO_3$ based on Dolores River sampling data downstream from the Adits at sampling location COSJDO03-2.5. Data were evaluated for a period of record from October 1996 through July 1997.

For the Argentine Seep, and the Rico Boy, Santa Cruz, and Silver Swan Adits, which discharge to receiving waters assumed to have a low flow of zero, the hardness of the discharges was evaluated. Specifically, the following periods of record were available and were evaluated when determining the average hardness:

- Silver Swan Adit: October 1995 through July 1997
- Rico Boy Adit: October 1995 through July 1997
- Santa Cruz Adit: October 1995 through July 1997
- Argentine Seep: October 1996 through July 1997

Because the Columbia Tailings Seep has not been sampled, there were no hardness data that were exclusive of the flow in the side channel of the Dolores River. Therefore, the hardness data for the Argentine Seep, which has a source of discharge comparable to the Columbia Tailings Seep, was used as a comparable hardness.

Data from each discharge revealed an average hardness concentration greater than 400 mg/l as $CaCO_3$. According to the *Basic Standards and Methodologies for Surface Water, Regulation 31*, hardness must be capped at 400 mg/l when determining in-stream metal water quality standards using the equations in the TVS. This hardness of 400 mg/l was therefore used for discharges to receiving waters with a low flow of zero.

These hardness values and the formulas contained in the TVS were used to calculate the in-stream water quality standards for metals. The results based on the TVS equations recently approved by the WQCC are shown in Tables A-6 through A-10.

Ambient Water Quality

The WQCD evaluates ambient water quality based on a variety of statistical methods as prescribed in Section 31.8(2)(a)(i) and 31.8(2)(b)(i)(B) of *The Basic Standards and Methodologies for Surface Water, Regulation 31*. Ambient water quality is evaluated in this WQA for use in determining assimilative capacities for pollutants of concern, and in conducting antidegradation reviews.

It is the general approach of the WQCD to use the most recent five years of data, if available, when determining ambient water quality. Where antidegradation reviews apply, the WQCD attempts to evaluate only data collected from September 30, 1995 through September 30, 2000 because antidegradation reviews are intended to characterize water quality as of September 30, 2000. Where adequate data are not available, a greater time frame may be evaluated. For portions of this analysis, the ambient water quality data were limited to data from October 1996 forward, which reflects the conditions after completion of Voluntary Cleanup (VCUP) activities. This is because VCUP activities conducted at multiple locations in the Silver Creek and Dolores River basins were designed, in part, to improve ambient water quality. Thus, evaluation of pre-VCUP data would not be reflective of current ambient water quality. Note, however, that VCUP activities did not affect ambient water quality in Silver Creek above the confluence of the tributary containing the Argentine Seep and also did not affect the ambient water quality in the Dolores River above the confluence of Silver Creek. Thus, the data evaluated at these upstream locations did include the analytical results from sampling prior to 1996, where appropriate.

Data used for this analysis primarily resulted from sampling collected by the WQCD and ESA Consultants, Inc., consultants for ARCO. These data reflected analyses in the dissolved form, which is the form of the in-stream standards for most of the pollutants of concern. Use of data collected by consultants for EPA Region 8 was limited. Analytical results from samples collected by consultants on behalf of EPA Region 8 from September 11-14, 1995 included data for total mercury, total recoverable arsenic, total recoverable iron and total recoverable chromium. Note, however, that these data were only used for those locations not subject to VCUP activities for the reasons discussed above. Samples collected by consultants on behalf of EPA Region 8 on April 14, 2000 were in total metals form. They were thus used for total mercury and, because the concentrations of total metals for several pollutants were commensurate with the findings of metals in the total recoverable form, for total recoverable arsenic, total recoverable iron and total recoverable chromium.

Table A-6

Water Quality Standards for Metals for Stream Segment COSJDO03, for the Dolores River After Confluence of the St. Louis Ponds Discharge

Based on the Table Value Standards Contained in the Colorado Department of Public Health and Environment Water Quality Control Commission *Regulation 34*

Calculated Using the Following Value for Hardness as $CaCO_3$: 171 mg/l

Parameter	***In-Stream Water***			***Formula Used***
Cadmium, Dissolved	Acute	7.6	ug/l	$[1.13677-0.04184\ln(hardness)][e^{(1.128(\ln(hardness))-3.6867)}]$
	Trout	NA	ug/l	No applicable standard
	Chronic	3.3	ug/l	$[1.10167-0.04184\ln(hardness)][e^{(0.7852(\ln(hardness))-2.715)}]$
Hexavalent Chromium, Dissolved	Acute	16	ug/l	Numeric standards provided, formula not applicable
	Chronic	11	ug/l	Numeric standards provided, formula not applicable
Copper, Dissolved	Acute	22	ug/l	$e^{(0.9422(\ln(hardness))-1.7408)}$
	Chronic	14	ug/l	$e^{(0.8545(\ln(hardness))-1.7428)}$
Lead, Dissolved	Acute	115	ug/l	$[1.46203-0.145712\ln(hardness)][e^{(1.273(\ln(hardness))-1.46)}]$
	Chronic	4.5	ug/l	$[1.46203-0.145712\ln(hardness)][e^{(1.273(\ln(hardness))-4.705)}]$
Manganese, Dissolved	Acute	3570	ug/l	$e^{(0.3331(\ln(hardness))+6.4676)}$
	Chronic	1972	ug/l	$e^{(0.3331(\ln(hardness))+5.8743)}$
Nickel, Dissolved	Acute	737	ug/l	$e^{(0.846(\ln(hardness))+2.253)}$
	Chronic	82	ug/l	$e^{(0.846(\ln(hardness))+0.0554)}$
Selenium, Dissolved	Acute	18.4	ug/l	Numeric standards provided, formula not applicable
	Chronic	4.6	ug/l	Numeric standards provided, formula not applicable
Silver, Dissolved	Acute	5.1	ug/l	$\frac{1}{2}\, e^{(1.72(\ln(hardness))-6.52)}$
	Trout	NA	ug/l	No applicable standard
	Chronic	0.81	ug/l	$e^{(1.72(\ln(hardness))-9.06)}$
Zinc, Dissolved	Acute	185	ug/l	$e^{(0.8473(\ln(hardness))+0.8618)}$
	Chronic	186	ug/l	$e^{(0.8473(\ln(hardness))+0.8699)}$

Table A-7

Water Quality Standards for Metals for Stream Segment COSJDO09, for Silver Creek After Confluence of the Blaine Adit

Based on the Table Value Standards Contained in the Colorado Department of Public Health and Environment Water Quality Control Commission *Regulation 34*

Calculated Using the Following Value for Hardness as $CaCO_3$:		84	mg/l	
Parameter	***In-Stream Water***			***Formula Used***
Cadmium, Dissolved	Acute	NA	ug/l	No applicable standard
	Trout	3.1	ug/l	$[1.13677-0.04184\ln(hardness)][e^{(1.128(\ln(hardness))-3.828)}]$
	Chronic	2.0	ug/l	$[1.10167-0.04184\ln(hardness)][e^{(0.7852(\ln(hardness))-2.715)}]$
Hexavalent Chromium, Dissolved	Acute	16	ug/l	Numeric standards provided, formula not applicable
	Chronic	11	ug/l	Numeric standards provided, formula not applicable
Copper, Dissolved	Acute	11	ug/l	$e^{(0.9422(\ln(hardness))-1.7408)}$
	Chronic	7.7	ug/l	$e^{(0.8545(\ln(hardness))-1.7428)}$
Lead, Dissolved	Acute	53	ug/l	$[1.46203-0.145712\ln(hardness)][e^{(1.273(\ln(hardness))-1.46)}]$
	Chronic	2.1	ug/l	$[1.46203-0.145712\ln(hardness)][e^{(1.273(\ln(hardness))-4.705)}]$
Manganese, Dissolved	Acute	2817	ug/l	$e^{(0.3331(\ln(hardness))+6.4676)}$
	Chronic	1557	ug/l	$e^{(0.3331(\ln(hardness))+5.8743)}$
Nickel, Dissolved	Acute	404	ug/l	$e^{(0.846(\ln(hardness))+2.253)}$
	Chronic	45	ug/l	$e^{(0.846(\ln(hardness))+0.0554)}$
Selenium, Dissolved	Acute	18.4	ug/l	Numeric standards provided, formula not applicable
	Chronic	4.6	ug/l	Numeric standards provided, formula not applicable
Silver, Dissolved	Acute	1.5	ug/l	$\frac{1}{2}\, e^{(1.72(\ln(hardness))-6.52)}$
	Trout	0.056	ug/l	$e^{(1.72(\ln(hardness))-10.51)}$
	Chronic	NA	ug/l	No applicable standard
Zinc, Dissolved (through 12/31/06)	Acute	NA	ug/l	No numeric standards proposed
	Chronic	670	ug/l	Numeric standards proposed, formula not applicable

Table A-8

Water Quality Standards for Metals for Stream Segment COSJDO09, for Silver Creek After Confluence of the Tributary Containing the Argentine Seep

Based on the Table Value Standards Contained in the Colorado Department of Public Health and Environment Water Quality Control Commission *Regulation 34*

Calculated Using the Following Value for Hardness as $CaCO_3$: 213 mg/l

Parameter	***In-Stream Water***			***Formula Used***
Cadmium, Dissolved	Acute	NA	ug/l	No applicable standard
	Trout	8.4	ug/l	$[1.13677-0.04184\ln(\text{hardness})][e^{(1.128(\ln(\text{hardness}))-3.828)}]$
	Chronic	3.9	ug/l	$[1.10167-0.04184\ln(\text{hardness})][e^{(0.7852(\ln(\text{hardness}))-2.715)}]$
Hexavalent Chromium, Dissolved	Acute	16	ug/l	Numeric standards provided, formula not applicable
	Chronic	11	ug/l	Numeric standards provided, formula not applicable
Copper, Dissolved	Acute	27	ug/l	$e^{(0.9422(\ln(\text{hardness}))-1.7408)}$
	Chronic	17	ug/l	$e^{(0.8545(\ln(\text{hardness}))-1.7428)}$
Lead, Dissolved	Acute	146	ug/l	$[1.46203-0.145712\ln(\text{hardness})][e^{(1.273(\ln(\text{hardness}))-1.46)}]$
	Chronic	5.7	ug/l	$[1.46203-0.145712\ln(\text{hardness})][e^{(1.273(\ln(\text{hardness}))-4.705)}]$
Manganese, Dissolved	Acute	3841	ug/l	$e^{(0.3331(\ln(\text{hardness}))+6.4676)}$
	Chronic	2122	ug/l	$e^{(0.3331(\ln(\text{hardness}))+5.8743)}$
Nickel, Dissolved	Acute	888	ug/l	$e^{(0.846(\ln(\text{hardness}))+2.253)}$
	Chronic	99	ug/l	$e^{(0.846(\ln(\text{hardness}))+0.0554)}$
Selenium, Dissolved	Acute	18.4	ug/l	Numeric standards provided, formula not applicable
	Chronic	4.6	ug/l	Numeric standards provided, formula not applicable
Silver, Dissolved	Acute	7.5	ug/l	$\frac{1}{2}\, e^{(1.72(\ln(\text{hardness}))-6.52)}$
	Trout	0.28	ug/l	$e^{(1.72(\ln(\text{hardness}))-10.51)}$
	Chronic	NA	ug/l	No applicable standard
Zinc, Dissolved (through 12/31/06)	Acute	NA	ug/l	No numeric standards proposed
	Chronic	670	ug/l	Numeric standards proposed, formula not applicable

Table A-9

Water Quality Standards for Metals for Stream Segment COSJDO03, for the Dolores River after the Confluence of the Tributaries Containing the Columbia Tailings Seep, and the Rico Boy, Santa Cruz, and Silver Swan Adits

Based on the Table Value Standards Contained in the Colorado Department of Public Health and Environment Water Quality Control Commission *Regulation 34*

Calculated Using the Following Value for Hardness as $CaCO_3$:				166 mg/l
Parameter	***In-Stream Water***			***Formula Used***
Cadmium, Dissolved	Acute	7.4	ug/l	$[1.13677-0.04184\ln(hardness)][e^{(1.128(\ln(hardness))-3.6867)}]$
	Trout	NA	ug/l	No applicable standard
	Chronic	3.3	ug/l	$[1.10167-0.04184\ln(hardness)][e^{(0.7852(\ln(hardness))-2.715)}]$
Hexavalent Chromium, Dissolved	Acute	16	ug/l	Numeric standards provided, formula not applicable
	Chronic	11	ug/l	Numeric standards provided, formula not applicable
Copper, Dissolved	Acute	22	ug/l	$e^{(0.9422(\ln(hardness))-1.7408)}$
	Chronic	14	ug/l	$e^{(0.8545(\ln(hardness))-1.7428)}$
Lead, Dissolved	Acute	112	ug/l	$[1.46203-0.145712\ln(hardness)][e^{(1.273(\ln(hardness))-1.46)}]$
	Chronic	4.3	ug/l	$[1.46203-0.145712\ln(hardness)][e^{(1.273(\ln(hardness))-4.705)}]$
Manganese, Dissolved	Acute	3535	ug/l	$e^{(0.3331(\ln(hardness))+6.4676)}$
	Chronic	1953	ug/l	$e^{(0.3331(\ln(hardness))+5.8743)}$
Nickel, Dissolved	Acute	719	ug/l	$e^{(0.846(\ln(hardness))+2.253)}$
	Chronic	80	ug/l	$e^{(0.846(\ln(hardness))+0.0554)}$
Selenium, Dissolved	Acute	18.4	ug/l	Numeric standards provided, formula not applicable
	Chronic	4.6	ug/l	Numeric standards provided, formula not applicable
Silver, Dissolved	Acute	4.9	ug/l	$\frac{1}{2} e^{(1.72(\ln(hardness))-6.52)}$
	Trout	NA	ug/l	No applicable standard
	Chronic	0.77	ug/l	$e^{(1.72(\ln(hardness))-9.06)}$
Zinc, Dissolved	Acute	180	ug/l	$e^{(0.8473(\ln(hardness))+0.8618)}$
	Chronic	182	ug/l	$e^{(0.8473(\ln(hardness))+0.8699)}$

Table A-10

Water Quality Standards for Metals for Stream Segments COSJDO03 and COSJDO05, for Seeps and Adits to Receiving Waters with a Low Flow of Zero

Based on the Table Value Standards Contained in the Colorado Department of Public Health and Environment Water Quality Control Commission *Regulation 34*

Calculated Using the Following Value for Hardness as $CaCO_3$:			400	mg/l
Parameter	***In-Stream Water***			***Formula Used***
Cadmium, Dissolved	Acute	19	ug/l	$[1.13677-0.04184\ln(\text{hardness})][e^{(1.128(\ln(\text{hardness}))-3.6867)}]$
	Trout	17	ug/l	$[1.13677-0.04184\ln(\text{hardness})][e^{(1.128(\ln(\text{hardness}))-3.828)}]$
	Chronic	6.2	ug/l	$[1.10167-0.04184\ln(\text{hardness})][e^{(0.7852(\ln(\text{hardness}))-2.715)}]$
Hexavalent Chromium, Dissolved	Acute	16	ug/l	Numeric standards provided, formula not applicable
	Chronic	11	ug/l	Numeric standards provided, formula not applicable
Copper, Dissolved	Acute	50	ug/l	$e^{(0.9422(\ln(\text{hardness}))-1.7408)}$
	Chronic	29	ug/l	$e^{(0.8545(\ln(\text{hardness}))-1.7428)}$
Lead, Dissolved	Acute	281	ug/l	$[1.46203-0.145712\ln(\text{hardness})][e^{(1.273(\ln(\text{hardness}))-1.46)}]$
	Chronic	11	ug/l	$[1.46203-0.145712\ln(\text{hardness})][e^{(1.273(\ln(\text{hardness}))-4.705)}]$
Manganese, Dissolved	Acute	4738	ug/l	$e^{(0.3331(\ln(\text{hardness}))+6.4676)}$
	Chronic	2618	ug/l	$e^{(0.3331(\ln(\text{hardness}))+5.8743)}$
Nickel, Dissolved	Acute	1513	ug/l	$e^{(0.846(\ln(\text{hardness}))+2.253)}$
	Chronic	168	ug/l	$e^{(0.846(\ln(\text{hardness}))+0.0554)}$
Selenium, Dissolved	Acute	18.4	ug/l	Numeric standards provided, formula not applicable
	Chronic	4.6	ug/l	Numeric standards provided, formula not applicable
Silver, Dissolved	Acute	22	ug/l	$\frac{1}{2}\, e^{(1.72(\ln(\text{hardness}))-6.52)}$
	Trout	0.81	ug/l	$e^{(1.72(\ln(\text{hardness}))-10.51)}$
	Chronic	3.5	ug/l	$e^{(1.72(\ln(\text{hardness}))-9.06)}$
Zinc, Dissolved	Acute	379	ug/l	$e^{(0.8473(\ln(\text{hardness}))+0.8618)}$
	Chronic	382	ug/l	$e^{(0.8473(\ln(\text{hardness}))+0.8699)}$

It is the general approach of the WQCD to summarize ambient water quality data by the 15th, 50th, and 85th percentiles and the mean. When sample results are below detection levels, the value of zero is used in accordance with the WQCD's standard approach for summarization and averaging. A further discussion of the evaluation of ambient water quality data at each specific sampling location is contained in the paragraphs that follow.

Ambient Water Quality at Sampling Location COSJDO03-0.4: Ambient water quality data for the Dolores River upstream of the St. Louis Ponds include data collected at locations as far 3 miles upstream. Data collected at locations farther upstream were not considered to be commensurate with the Dolores River immediately upstream of the St. Louis Ponds, and thus were excluded. There were six sampling events that were used to characterize the Dolores River upstream of the St. Louis Ponds, specifically data collected during the period of record from April 1998 through June 2000. These data are summarized in Table A-11.

Table A-11

Ambient Water Quality for Stream Segment COSJDO03-0.4

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Chronic Stream Standard*	*Notes*
As, Trec (ug/l)	4	0	0.50	0.66	0.43	100	1
Cd, Dis (ug/l)	5	0	0	0.19	0.082	3.3	
Cr^{+3}, Trec (ug/l)	4	0	0.95	33	15	NA	1
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	11	2
Cu, Dis (ug/l)	5	0	0.60	0.60	0.36	14	
CN, Free (ug/l)	1	0	0	0	0	5.0	3,4
Fe, Trec (ug/l)	4	323	740	1320	814	1000	1
Pb, Dis (ug/l)	5	0.060	0.20	0.48	0.28	4.5	
Mn, Dis (ug/l)	5	3.7	5.2	47	25	1972	
Hg, Tot (ug/l)	4	0	0	0	0	0.010	
Ni, Dis (ug/l)	3	0.48	0.51	0.66	0.56	82	
Se, Dis (ug/l)	3	0.43	0.50	0.50	0.47	4.6	
Ag, Dis (ug/l)	5	0	0	0.050	0.022	0.81	
Zn, Dis (ug/l)	5	1.1	2.8	10	5.6	186	

Note 1: Total metals data from the URS sampling conducted on 6/27/00 were combined with total recoverable metals data when summarizing the data used for As Trec, Fe Trec, and Cr+3 Trec.

Note 2: Data for dissolved chromium were not available in the hexavalent form. Because trivalent chromium is the form of chromium that is naturally occuring, the concentration of dissolved hexavalent chromium was assumed to equal zero.

Note 3: The stream standard reflected herein is the acute stream standard.

Note 4: Data for total cyanide collected prior to 9/30/95 were used for free CN in the absence of available data for the period of record of 9/30/95 through 9/30/00.

The data in Table A-11 are used as part of Scenario 2. In this scenario, the hydrological connection between the St. Louis Ponds and the Dolores River is assumed to be eliminated and therefore the ambient water quality data from sampling location COSJDO03-0.4 are assumed to be representative of the ambient water quality.

Ambient Water Quality at Sampling Location COSJDO03-1.1: Ambient water quality data from sampling conducted immediately upstream of the St. Louis Ponds discharge point were limited to two sampling events. These data are used because sampling at this point suggests that seepage from the ponds' system impacts the water quality in the Dolores River. However, because these sampling events were limited, data from sampling location COSJDO03-0.4 were used to supplement the ambient water quality data available at this location. Ambient water quality data evaluated at this location include data collected during the period of record from October 1999 through June 2000. These data are summarized in Table A-12.

Table A-12

Ambient Water Quality for Stream Segment COSJDO03-1.1

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Chronic Stream Standard*	*Notes*
As, Trec (ug/l)	4	0	0.50	0.66	0.43	100	1
Cd, Dis (ug/l)	2	0.23	0.31	0.38	0.31	3.3	
Cr^{+3}, Trec (ug/l)	4	0	0.95	33	15	NA	1
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	11	2
Cu, Dis (ug/l)	5	0	0.60	0.60	0.36	14	3
CN, Free (ug/l)	1	0	0	0	0	5.0	4
Fe, Trec (ug/l)	4	323	740	1320	814	1000	1,3
Pb, Dis (ug/l)	2	0.72	0.75	0.79	0.75	4.5	
Mn, Dis (ug/l)	2	199	282	364	282	1972	
Hg, Tot (ug/l)	4	0	0	0	0	0.010	1
Ni, Dis (ug/l)	3	0.48	0.51	0.66	0.56	82	1
Se, Dis (ug/l)	3	0.43	0.50	0.50	0.47	4.6	1
Ag, Dis (ug/l)	2	0.13	0.24	0.34	0.24	0.81	
Zn, Dis (ug/l)	5	1.1	2.8	10	5.6	186	3

Note 1: In the absence of data for these parameters at this location, the data reflecting the ambient upstream water quality above the St. Louis Ponds at sampling location COSJDO03-0.4 were used.

Note 2: Data for dissolved chromium were not available in the hexavalent form. Because trivalent chromium is the form of chromium that is naturally occuring, the concentration of dissolved hexavalent chromium was assumed to equal zero.

Note 3: Although data are available for these parameters at this location, the ambient water quality data collected reflecting ambient upstream water quality at sampling location COSJDO03-0.4 were used to be protective or because it was assumed to be more applicable.

Note 4: The stream standard reflected herein is the acute stream standard.

As indicated in the footnotes for zinc and for copper, ambient water quality data were available at sampling location COSJDO03-1.1, but data from sampling location COSJDO03-0.4 were used. Lab error was suspected in one of the two copper analytical results. Specifically, data from June 27, 2000 were found at a concentration of 30 ug/l. This was the same as the discharge concentration from the St. Louis Ponds. However, downstream samples collected on this same date indicate a concentration at less than detection levels of 10 ug/l. Furthermore, the ratios of the concentration at this location to the downstream ambient water quality, as well as to the discharge concentrations from the St. Louis Ponds, were not commensurate. For these reasons, the datum point was excluded from consideration, leaving only the single remaining datum found at less than detectable levels. Because one datum point was not considered to be representative, it was necessary to rely on copper data from sampling location COSJDO03-0.4.

For zinc, the ambient water quality at COSJDO03-1.1 was of higher quality than that found at sampling location COSJDO03-0.4 and thus the data from sampling location COSJDO03-0.4 were used in order to be conservative.

The data in Table A-12 are used as part of Scenario1.

Ambient Water Quality at Sampling Location COSJDO09-0.1: Ambient water quality data for Silver Creek includes data collected immediately upstream of the Blaine Adit. Additionally, because the Blaine Adit was sealed until 1997, the ambient water quality data downstream of the Blaine Adit and upstream of the tributary containing the Argentine Seep were reflective of upstream Silver Creek ambient water quality and were thus used. There were nine sampling events that were combined to characterize Silver Creek upstream of the Blaine Adit. These data are summarized in Table A-13.

Table A-13

Ambient Water Quality for Stream Segment COSJDO09-0.1

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Chronic Stream Standard*	*Notes*
As, Trec (ug/l)	2	0.14	0.45	0.77	0.45	100	
Cd, Dis (ug/l)	8	1.4	2.3	3.3	2.2	2.0	
Cr^{+3}, Trec (ug/l)	2	0.030	0.10	0.17	0.10	100	
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	11	1
Cu, Dis (ug/l)	8	0	0	9.6	3.2	7.7	
CN, Free (ug/l)	1	0	0	0	0	5.0	2
Fe, Trec (ug/l)	3	300	1000	1266	793	NA	
Pb, Dis (ug/l)	8	0.015	1.1	3.2	1.5	2.1	
Mn, Dis (ug/l)	8	21	73	136	74	1557	
Hg, Tot (ug/l)	2	0	0	0	0	0.010	
Ni, Dis (ug/l)	1	0.51	0.51	0.51	0.51	45	
Se, Dis (ug/l)	1	0	0	0	0	4.6	
Ag, Dis (ug/l)	8	0	0	0	0.0088	0.056	
Zn, Dis (ug/l)	8	353	473	765	614	670	

Note 1: Data for dissolved chromium were not available in the hexavalent form. Because trivalent chromium is the form of chromium that is naturally occuring, the concentration of dissolved hexavalent chromium was assumed to equal zero.

Note 2: The stream standard reflected herein is the acute stream standard. Because no free cyanide data were avialable, data reflecting total cyanide were used.

The data evaluated from this location include data for the period of record from September 1995 through June 2000. At this location, limiting the evaluation to data collected only during the antidegradation review period is not appropriate because, as discussed later in this WQA, antidegradation reviews do not apply to stream segment COSJDO09. No remediation activities were conducted above the confluence of Silver Creek and the tributary to which the Argentine Seep discharges, and thus data collected prior to VCUP activities would be reflective of the ambient water quality. Although older data were evaluated, the data collected more than five years ago were found at less than detection levels and the detection levels were higher than the commonly found ambient water quality concentrations. These data were therefore excluded to avoid skewing the ambient water quality data evaluation.

The ambient water quality data for sampling location COSJDO09-0.1 were used in all scenarios.

Ambient Water Quality for Low Flow Zero Receiving Waters

The ambient water quality was not assessed for the receiving waters of the seeps and adits where the in-stream low flow condition is zero, because the corresponding in-stream low flow condition of zero would negate the impacts of the ambient water quality data.

III. Water Quantity

The Colorado Regulations specify the use of low flow conditions when establishing water quality based effluent limitations, specifically the acute and chronic low flows. The acute low flow, referred to as 1E3, represents the one-day low flow recurring in a three-year interval. The chronic low flow, 30E3, represents the 30-day average low flow recurring in a three-year interval.

Low Flow Analysis

To determine the low flows at the multiple locations evaluated in this WQA, a flow gage measurement immediately upstream of the discharge should be used. Because there were no flow gages immediately upstream of the discharges from the Rico-Argentine Mine area, a downstream gage station was used.

Daily flows from the USGS Gage Station 09165000 (Dolores River near Rico, CO) were obtained and the 1E3 and 30E3 low flows were calculated using U.S. Environmental Protection Agency (EPA) DFLOW software. The output from DFLOW provides calculated acute and chronic low flows for each month.

To estimate the low flows upstream of the discharges of concern, one major diversion and contributions by the discharges of concern prior to the gage station had to be evaluated.

According to discussions with the local Water Commissioner, there is one major diversion upstream of Gage Station 09165000. Specifically, the Town of Rico water supply diverts flow in Silver Creek at a point upstream of the Blaine Adit discharge point. The local Water Commissioner was not able to estimate the amount of the diversion and suggested contacting the Town of Rico. Discussions with Town of Rico representatives revealed that an estimated 50,000 gpd (0.077 cfs) are diverted from Silver Creek at a point above the Blaine Adit discharge point. Flow from Silver Creek is diverted continuously to the Town of Rico Water Supply. According to the local Water Commissioner, there are only two other diversions in this basin. These diversions supply water to single cabin claims and therefore were considered negligible for purposes of this evaluation.

To estimate the contributions by discharges of concern, the historical average discharges were determined. These included:

- Blaine Adit at 1.5 gpm (0.0033 cfs) based on the reported long-term average and a period of record from October 1999 through June 2000
- Argentine Seep at 51 gpm (0.11 cfs) based on the post-VCUP cleanup period from October 1996 through July 1997
- St. Louis Ponds System based on the monthly average flow determined from DMR data available for a period or record from January 1985 through December 1986 for the three seasons that were evaluated at the request of ARCO:
  - 1.4 cfs from January through March
  - 2.0 cfs from April through September
  - 1.5 cfs from October through December
- Columbia Tailings Seep at 0.034 MGD (0.053 cfs) which is the incremental Dolores River basin flow from the confluence of Silver Creek to a point upstream of the Silver Swan Adit
- Rico Boy Adit at 3.5 gpm (0.0078 cfs) based on a period of record from October 1995 through July 1997
- Santa Cruz Adit at 22 gpm (0.049 cfs) based on a period of record from October 1995 through July 1997
- Silver Swan Adit at 45 gpm (0.10 cfs) based on a period of record from October 1995 through July 1997.

The average diversion flow of 0.077 cfs was added and the seasonal average flows for the St. Louis Ponds and the annual average flows from the other discharge points were deducted to establish a flow record based on natural drainage. Additionally, during the months of March, April, May, June, and October, the acute low flow calculated by DFLOW exceeded the chronic low flow. In accordance with WQCD standard procedures, the acute low flow was thus set equal to the chronic low flow for these months. This synthesized flow record was then used to estimate low flows at multiple locations throughout the Dolores River basin.

Flow data from October 1, 1988 through September 30, 1996 and beginning again from October 1, 1998 through September 30, 2000 were available from the gage station. This gage station and time frames were deemed the most accurate and representative of current flows and were therefore used in this analysis.

To estimate the low flows at each discharge point, the ratio of the watershed area above the discharge point to the watershed area above the gage station was determined. The low flow calculated at the gage station was then multiplied by the ratio of watershed areas to determine the low flows available upstream of each discharge point.

Based on the low flow analysis described previously, the upstream low flows at multiple locations through the Dolores River Basin were calculated and are presented in Table A-14.

Currently, it is the WQCD's standard approach to assume that there is no available dilution in a wetlands area and in unnamed tributaries until such time as a mixing zone study has been completed to demonstrate the available dilution. Furthermore, comparable findings are expected in the side channel of the Dolores River upstream of the Columbia Tailings Seep. Thus, for purposes of this analysis, low flows for the wetlands areas, the side channel of the Dolores River and for the unnamed tributary to Silver Creek are summarized in Table A-15.

Table A-14

Low Flows for the Dolores River at Multiple Locations

Location	Low Flow (cfs)	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
COSJDO03, Mile 0.4 (Dolores R. Above St Louis Ponds, Ambient)	1E3 Acute	2.9	3.1	3.0	4.1	10	28	29	17	12	15	6.9	2.9	2.9
	30E3 Chronic	3.9	3.9	3.9	4.1	10	28	29	18	18	15	6.9	3.9	3.9
COSJDO03, Mile 1.1 (Dolores R. Prior to St. Louis Ponds Discharge)	1E3 Acute	2.9	3.1	3.1	4.1	10	28	29	17	12	15	6.9	2.9	2.9
	30E3 Chronic	3.9	4.0	4.0	4.1	10	28	29	18	18	15	6.9	4.0	3.9
COSJDO09, Mile 0.1 (Silver Cr. Above Blaine Adit)	1E3 Acute	0.12	0.14	0.13	0.20	0.64	1.9	1.9	1.1	0.78	0.92	0.40	0.12	0.12
	30E3 Chronic	0.19	0.19	0.19	0.20	0.64	1.9	1.9	1.2	1.2	0.97	0.40	0.19	0.19
COSJDO09, Mile 0.4 (Silver Cr. Above Argentine Seep)	1E3 Acute	0.18	0.20	0.19	0.29	0.84	2.4	2.5	1.4	1.0	1.2	0.54	0.18	0.18
	30E3 Chronic	0.27	0.27	0.27	0.29	0.84	2.4	2.5	1.5	1.5	1.3	0.54	0.27	0.27
COSJDO03, Mile 2.0 (Dolores R. Above Rico Boy, Santa Cruz Adits)	1E3 Acute	4.8	5.0	4.9	6.1	14	34	35	21	16	18	9.4	4.8	4.8
	30E3 Chronic	5.9	5.9	5.9	6.1	14	34	35	22	22	19	9.4	6.0	5.9
COSJDO03, Mile 6.2 (Delores R @ Gage Station)	1E3 Acute	5.9	6.1	6.0	7.5	17	43	44	26	20	23	12	5.9	5.9
	30E3 Chronic	7.3	7.3	7.3	7.5	17	43	44	28	28	24	12	7.4	7.3

Table A-15

Low Flows for Wetlands Areas, the Unnamed Tributary to Silver Creek and the Side Channel to the Dolores River

Location	Low Flow (cfs)	Annual	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wetlands, Unnamed Tributary, and Side Channel	1E3 Acute	0	0	0	0	0	0	0	0	0	0	0	0	0
	30E3 Chronic	0	0	0	0	0	0	0	0	0	0	0	0	0

IV. Technical Analysis

In-stream background data and low flows evaluated in sections II and III are ultimately used to determine the assimilative capacity of the receiving waters near the Rico-Argentine Mine area for pollutants of concern. It is the WQCD's approach to conduct a technical analysis of stream assimilative capacity using the lowest of the monthly low flows (referred to as the annual low flow) as calculated in the low flow analysis. However, based on a request by ARCO for the consideration of seasonal effluent discharges from the St. Louis Pond System, this WQA has been developed considering seasonal low flows in accordance with the following seasons:

- January through March
- April through September
- October through December

The WQCD's standard analysis consists of steady-state, mass-balance calculations for most pollutants and modeling for pollutants such as ammonia. The mass-balance equation is used by the WQCD to calculate the maximum allowable concentration of pollutants in the effluent, and accounts for the upstream concentration of a pollutant, critical low flow (minimal dilution), effluent flow and the water quality standard. The mass-balance equation is expressed as:

$$M_2 = \frac{M_3Q_3 - M_1Q_1}{Q_2}$$

where:

Q_1 = Upstream low flow (1E3 or 30E3)
Q_2 = Average daily effluent flow
Q_3 = Downstream flow ($Q_1 + Q_2$)
M_1 = In-stream background pollutant concentrations
M_2 = Calculated maximum allowable effluent pollutant concentration (a.k.a, the water quality-based effluent limitation (WQBEL))
M_3 = Maximum allowable in-stream pollutant concentration (water quality standards)

Note that in the establishment of M_1, the WQCD's Assessment Unit approach was considered. Specifically, it is the WQCD Assessment Unit's approach to establish M_1 equal to existing quality. Thus, the M_1 for dissolved metals, total metals, and cyanide will be equal to the 85th percentile ambient background concentration, and the M_1 for total recoverable metals will be equal to the 50th percentile ambient background concentration.

For purposes of establishing WQBELs when low flows are equal to zero, a modified version of the mass-balance equation is used. Specifically, when Q_1 equals zero, Q_2 equals Q_3, and the following results:

$$M_2 = M_3$$

Because the low flow (Q_1) for the wetlands areas, the unnamed tributary to Silver Creek upstream of the Argentine Seep, and the side channel of the Dolores River upstream of the Columbia Tailings Seep are assumed to equal zero, the assimilative capacity of these receiving waters for the pollutants of concern is equal to the in-stream water quality standards.

The above mass-balance approach to calculation of WQBELs is ideal when WQAs address a single point source discharge at a single discharge location. But, for WQAs involving multiple point sources at varying discharge locations with varying characteristics, a modified approach must be used as discussed at the end of this section.

Pollutants of Concern

As part of this WQA, cyanide and metals for which there are standards were evaluated. The pollutants of concern thus included:

- Total recoverable arsenic (As, Trec)
- Dissolved cadmium (Cd, Dis)
- Total recoverable trivalent chromium (Cr^{+3}, Trec)
- Dissolved trivalent chromium (Cr^{+6}, Dis)
- Dissolved copper (Cu, Dis)
- Free cyanide (CN, Free)
- Total recoverable iron (Fe, Trec)
- Dissolved lead (Pb, Dis)
- Dissolved manganese (Mn, Dis)
- Total mercury (Hg, Tot)
- Dissolved nickel (Ni, Dis)
- Dissolved selenium (Se, Dis)
- Dissolved silver (Ag, Dis)
- Dissolved zinc (Zn, Dis)

During assessment of the facility, nearby facilities, and receiving stream water quality, no additional parameters were identified as pollutants of concern.

Rico-Argentine Mine Area: The Rico-Argentine Mine area is located at SE quarter of Section 25, T40N, R11W in Dolores County.

There are three discharges located to the North and East of the Town of Rico:

- The Blaine Adit, which discharges an average of 1.5 gpm (0.0033 cfs) to Silver Creek. The discharge enters Silver Creek approximately 0.1 miles downstream from the beginning of stream segment COSJDO09.
- The Argentine Seep, which discharges an average of 51 gpm (0.11 cfs) to a tributary to Silver Creek. The tributary enters Silver Creek approximately 0.4 miles downstream from the beginning of stream segment COSJDO09.
- The St. Louis Ponds System, which discharges an average of 744 gpm (1.7 cfs) to the Dolores River. The discharge enters the Dolores River approximately 1.2 miles downstream from the beginning of stream segment COSJDO03.

There are four discharges located to the South of the Town of Rico which are historic mine drainage adits and seeps. These include:

- The Columbia Tailings Seep, which discharges at an estimated average of 0.052 cfs via a side channel to the Dolores River.
- The Rico Boy Adit, which discharges an average of 3.5 gpm (0.0078 cfs) to wetlands that drains to the Dolores River. The wetlands drain to the Dolores River at two points

approximately 2.1 and 2.2 miles downstream from the beginning of stream segment COSJDO03.

- The Santa Cruz Adit, which discharges an average of 22 gpm (0.049 cfs) to the same wetlands as the Rico Boy Adit.
- The Silver Swan Adit, which discharges an average of 45 gpm (0.10 cfs) to wetlands that are also fed by Sulfur Creek, that drain to the Dolores River. The wetlands drain to the Dolores River at approximately 2.3 miles downstream from the beginning of stream segment COSJDO03.

The analyses that follow include evaluations based on these flows, with the exception of the St. Louis Ponds flow. Representatives of ARCO requested that the following 85^{th} percentile flows reflecting seasonal variations be used:

- January through March — 791 gpm (1.8 cfs)
- April through September — 1381 gpm (3.1 cfs)
- October through December — 956 gpm (2.1 cfs)

The WQCD procedure is to use the maximum of the monthly averages when determining the Q_2 to be used in the calculations of assimilative capacities. Consistent with WQCD procedure, the following flows were determined and used in later calculations:

- January through March — 1.3 MGD (2.0 cfs)
- April through September — 2.0 MGD (3.1 cfs)
- October through December — 1.4 MGD (2.2 cfs)

As noted above, seasonal flows were determined only for the St. Louis Ponds as a result of a request by ARCO. For all other discharges, the average of the measured discharge flows are used for the Q_2 except the Columbia Tailings Seep, which has no effluent discharge data. Therefore an estimated Q_2 flow was determined based on the incremental increase in the Dolores River basin flow from the confluence of Silver Creek to a point upstream of the Silver Swan Adit during low flow conditions.

Nearby Sources

An assessment of nearby facilities based on EPA's Permit Compliance System (PCS) database found three permitted dischargers in Dolores County. These were:

- COG582039, the Town of Dove Creek domestic Wastewater Treatment Plant (WWTP)
- COG582023, Lee, Richard domestic WWTP
- CO0045745, Lucas Property Holdings Gold Mine.

These facilities were located more than twenty miles from the Rico-Argentine Mine area and thus were not considered relevant to this assessment.

Technical Analyses for Scenarios 1 and 2

For the WQA for the Rico-Argentine Mine area, there are seven point source discharges that must be addressed at varying locations throughout the Dolores River basin. The characteristics including low flow, ambient upstream water quality concentrations, and hardness vary significantly throughout the basin. Furthermore, three different stream segments' standards and in-stream standards for metals at various locations must also be addressed. For this reason, the technical approach in the development of WQBELs for the seven point source discharges involved the following:

- Development of the maximum assimilative loading in lbs/day, which is the maximum load of pollutant that can be assimilated in a receiving water, at multiple locations
- Determination of background allocations in lbs/day, which is the load contributed by non-point sources for various zones in each segment
- Subtraction of the background allocations from the maximum assimilative loading to arrive at an available assimilative loading for the multiple dischargers
- Determination of the remaining allocations in lbs/day to distribute to individual point sources
- Calculation of the WQBELs in ug/l for each individual point source based on the allocations ultimately distributed.

The acute and chronic maximum assimilative loadings were calculated at the following locations:

- At the point of confluence of the Dolores River with the St. Louis Ponds based on the in-stream standards for stream segment COSJDO03 and the site-specific metals standards for the Dolores River downstream of the St. Louis Ponds, and a combination of the seasonal low flows of the Dolores River upstream of the St. Louis Ponds and the seasonal discharge flows, Q_2, of the St. Louis Ponds
- At the point of confluence of Silver Creek with the Blaine Adit based on the in-stream standards for stream segment COSJDO09 and the site-specific metal in-stream standards for Silver Creek downstream of the Blaine Adit, and a combination of the annual low flow of Silver Creek upstream of the Blaine Adit and the Q_2 flow of the Blaine Adit
- At the point of confluence of Silver Creek with the tributary containing the Argentine Seep based on the in-stream standards for stream segment COSJDO09 and the site-specific metal in-stream standards for Silver Creek downstream of the confluence of the tributary containing the Argentine Seep, and a combination of the annual low flow of Silver Creek upstream of the tributary containing the Argentine Seep and the Q_2 flow of the Argentine Seep
- At the point after the confluence of the Dolores River with the Columbia Tailings Seep, the Rico Boy, Santa Cruz, and Silver Swan Adits based on the in-stream standards for stream segment COSJDO03 and the site-specific metals' standards for the Dolores River downstream of the adits, and a combination of the annual low flow of the Dolores River upstream of the Silver Swan Adit (which includes the contributions of the Columbia Tailings Seep, and the Rico Boy and Santa Cruz Adits), the annual low flow of Sulfur Creek upstream of the Silver Swan wetlands, and the Q_2 flow of the Silver Swan Adit.

The background allocations were calculated at the following locations:

- Dolores River upstream of the St. Louis Ponds, based on ambient water quality data found at COSJDO03-0.4 and the acute and chronic low flows for the Dolores River upstream of the St. Louis Ponds (Scenario 2 only).
- Dolores River upstream of the St. Louis Ponds based on ambient water quality data found at COSJDO03-1.1 and the acute and chronic low flows for the Dolores River upstream of the St. Louis Ponds (Scenario 1only).

- Silver Creek upstream of the Blaine Adit based on ambient water quality data found at COSJDO09-0.1 and the acute and chronic low flows for Silver Creek upstream of the Blaine Adit.
- Silver Creek upstream of the tributary containing the Argentine Seep based on ambient water quality data found at COSJDO09-0.1 and the acute and chronic low flows for Silver Creek upstream of the tributary containing the Argentine Seep.
- Silver Creek downstream of the tributary containing the Argentine Seep calculated based on ambient water quality data found at COSJDO03-0.4 and the acute and chronic low flows for Silver Creek from a point downstream of the tributary containing the Argentine Seep to the mouth of Silver Creek. Note that the ambient water quality data from locations upstream in the Dolores River versus that found upstream in Silver Creek was used in this analysis to better simulate the downstream water quality of Silver Creek at the mouth.
- Dolores River downstream of the confluence of Silver Creek and upstream of the confluence of the wetlands drainage containing the Silver Swan Adit. This was based on ambient water quality data found at COSJDO03-0.4 and acute and chronic low flows of 0.2 cfs, which is the increase in flows between these two points, less adits and seep contributions.

Prior to distribution of the available assimilative loadings and calculation of the WQBELs for individual point sources, further adjustments were required. These adjustments were required because the Dolores River Basin in the area around the town of Rico is very narrow. If the entire dilution/assimilative capacity is allocated to the St. Louis Ponds at the upstream location, there is not enough assimilative capacity in the basin at points downstream to accommodate the assimilative capacities required for the other point source contributors. Thus, adjustments to the assimilative load available to the St. Louis Ponds were made to ensure that assimilative loadings for the Columbia Tailings Seep, and the Rico Boy, Santa Cruz and Silver Swan Adits were available.

The chronic and acute assimilative capacities for Scenario 1 are set forth in Tables A-16 and A-17, respectively, and the chronic and acute assimilative capacities for Scenario 2 are set forth in Tables A-18 and A-19, respectively. All adjustments are explained in the respective tables contained below. Furthermore, each table also indicates whether or not the current maximum discharge concentration of each point source is less than the derived WQBEL for that point source.

Table A-16
Chronic Assimilative Capacities for Metals for Scenario 1

Parameter	*St. Louis Ponds WQBELs (Jan-Mar)*	*St. Louis Ponds WQBELs (Apr-Sep)*	*St. Louis Ponds WQBELs (Oct-Dec)*	*Blaine Adit WQBELs*	*Argentine Seep WQBELs*	*Columbia Tailings Seep WQBELs*	*Rico Boy Adit WQBELs*	*Santa Cruz Adit WQBELs*	*Silver Swan Adit WQBELs*	*Notes*
As, Trec (ug/l)	286	413	264	5832	50	100	100	100	100	1,2
Cd, Dis (ug/l)	8.0	12	7.5	-73	3.3	6.2	6.2	6.2	6.2	3
Cr^{+3}, Trec (ug/l)	285	411	264	5852	50	100	100	100	100	2,4
Cr^{+6}, Dis (ug/l)	31	45	29	644	11	11	11	11	11	5
Cu, Dis (ug/l)	36	54	33	-102	29	29	29	29	29	6
CN, Free (ug/l)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Fe, Trec (ug/l)	1215	1642	1183	3630	1000	1000	1000	1000	1000	7
Pb, Dis (ug/l)	9.4	15	8.8	-61	10	11	11	11	11	8
Mn, Dis (ug/l)	4745	6873	4420	83372	2618	2618	2618	2618	2618	9
Hg, Tot (ug/l)	0.028	0.041	0.026	0.59	0.010	0.010	0.010	0.010	0.010	10
Ni, Dis (ug/l)	215	325	199	2607	168	168	168	168	168	11
Se, Dis (ug/l)	12	17	11	269	4.6	4.6	4.6	4.6	4.6	12
Ag, Dis (ug/l)	1.2	2.0	1.1	3.3	0.81	3.5	3.5	3.5	3.5	13
Zn, Dis (ug/l)	330	620	309	-4800	316	382	382	382	382	14

Table A-16 (Continued)
Note 1: Adjustments were made to the chronic total recoverable arsenic allocations by deducting 0.141 lbs/day from the available assimilative loadings for the St. Louis Ponds.
Note2: Although no chronic standard is in place for the Argentine Seep for the noted parameters, an available assimilative loading was determined and WQBELs assigned to ensure that adequate downstream assimilative capacities are available
Note 3: Adjustments were made to the chronic dissolved cadmium allocations by deducting 0.012 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the St. Louis Ponds during the months of October through March, the Argentine Seep, the Columbia Tailings Seep, and the Rico Boy Adit exceeded the derived WQBELs. Due to high upstream concentration of cadmium in relationship to the allowable in-stream concentration dictated by hardness downstream of the Blaine Adit, no discharge of cadmium is allowed from the Blaine Adit.
Note 4: Adjustments were made to the chronic total recoverable trivalent chromium allocations by deducting 0.141 lbs/day from the available assimilative loadings for the St. Louis Ponds.
Note 5: Adjustments were made to the chronic dissolved hexavalent chromium allocations by deducting 0.019 lbs/day from the available assimilative loadings for the St. Louis Ponds.
Note 6: Adjustments were made to the chronic dissolved copper allocations by deducting 0.052 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Columbia Tailings Seep exceeded the derived WQBEL. Due to high upstream concentration of copper in relationship to the allowable in-stream concentration dictated by hardness downstream of the Blaine Adit, no discharge of copper is allowed from the Blaine Adit.
Note 7: Adjustments were made to the chronic total recoverable iron allocations by deducting 3.292 lbs/day from the available assimilative loadings for the St. Louis Ponds.Because no standard for total recoverable iron is in place for Silver Creek, the Blaine Adit was allocated its maximum concentration. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the Rico Boy Adit and the Silver Swan Adit exceeded the derived WQBELs.
Note 8: Adjustments were made to the chronic dissolved lead allocations by deducting 0.027 lbs/day from the available assimilative loadings for the St. Louis Ponds. Due to high upstream concentration of lead in relationship to the allowable in-stream concentration dictated by hardness downstream of the Blaine Adit, no discharge of lead is allowed from the Blaine Adit.
Note 9: Adjustments were made to the chronic dissolved manganese allocations by deducting 4.773 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the Argentine Seep and the Columbia Tailings Seep exceeded the derived WQBELs.
Note 10: Adjustments were made to the chronic total mercury allocations by deducting 0.00002 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Silver Swan Adit exceeded the derived WQBEL.
Note 11: Adjustments were made to the chronic dissolved nickel allocations by deducting 0.317 lbs/day from the available assimilative loadings for the St. Louis Ponds.
Note 12: Adjustments were made to the chronic dissolved selenium allocations by deducting 0.009 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Columbia Tailings Seep exceeded the derived WQBEL.
Note 13: Adjustments were made to the chronic dissolved silver allocations by deducting 0.006 lbs/day from the available assimilative loadings for the St. Louis Ponds.
Note 14: Adjustments were made to the chronic dissolved zinc allocations by deducting 2.247 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available available assimilative loadings were not adequate and thus the maximum concentration being discharged by all point sources exceeded the derived WQBELs. Due to high upstream concentration of zinc in relationship to the allowable in-stream concentration of zinc dictated by hardness downstream of the Blaine Adit, no discharge of zinc is allowed from the Blaine Adit.

Table A-17
Acute Assimilative Capacities for Metals and Cyanide for Scenario 1

Parameter	St. Louis Ponds WQBELs (Jan-Mar)	St. Louis Ponds WQBELs (Apr-Sep)	St. Louis Ponds WQBELs (Oct-Dec)	Blaine Adit WQBELs	Argentine Seep WQBELs	Columbia Tailings Seep WQBELs	Rico Boy Adit WQBELs	Santa Cruz Adit WQBELs	Silver Swan Adit WQBELs	Notes
As, Trec (ug/l)	NA	NA	NA	NA	50	NA	NA	NA	NA	1
Cd, Dis (ug/l)	15	28	14	-4	17	19	19	19	19	2
Cr^{+3}, Trec (ug/l)	NA	NA	NA	NA	50	NA	NA	NA	NA	1
Cr^{+6}, Dis (ug/l)	37	65	34	598	16	16	16	16	16	4
Cu, Dis (ug/l)	46	85	42	62	50	50	50	50	50	5
CN, Free (ug/l)	12	20	11	187	5.0	5.0	5.0	5.0	5.0	6
Fe, Trec (ug/l)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Pb, Dis (ug/l)	236	447	215	1864	281	281	281	281	281	7
Mn, Dis (ug/l)	7509	13247	6859	100308	4738	4738	4738	4738	4738	8
Hg, Tot (ug/l)	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Ni, Dis (ug/l)	1565	2910	1423	15076	1513	1513	1513	1513	1513	9
Se, Dis (ug/l)	42	73	38	687	18	18	18	18	18	10
Ag, Dis (ug/l)	8.5	18	7.7	56	18	22	22	22	22	11
Zn, Dis (ug/l)	249	616	227	11428	379	379	379	379	379	12

Note 1: No adjustments were made to the allocations for the indicated parameters because the available assimilative capacities are adequate to accomodate the derived WQBELs and the derived WQBELs are greater than the maximum concentration of the indicated parameters being discharged at each point source.

Note 2: Adjustments were made to the acute dissolved cadmium allocations by deducting 0.041 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Rico Boy Adit exceeded the derived WQBEL. Due to high upstream concentration of cadmium in relationship to the allowable in-stream concentration dictated by hardness downstream of the Blaine Adit, no discharge of cadmium is allowed from the Blaine Adit.

Note 3: Adjustments were made to the acute dissolved trivalent chromium allocations by deducting 3.963 lbs/day from the available assimilative loadings for the St. Louis Ponds. Note that although no standard is in place for dissolved trivalent chromium at the Argentine Seep, an available assimilative loading was determined and WQBELs assigned to ensure that adequate downstream assimilative capacities are available.

Note 4: Adjustments were made to the acute dissolved hexavalent chromium allocations by deducting 0.039 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 5: Adjustments were made to the acute dissolved copper allocations by deducting 0.098 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the Blaine Adit and the Columbia Tailings Seep exceeded the derived WQBELs.

Note 6: Adjustments were made to the acute free cyanide allocations by deducting 0.012 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 7: Adjustments were made to the acute dissolved lead allocations by deducting 0.604 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 8: Adjustments were made to the acute dissolved manganese allocations by deducting 11.111 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the Blaine Adit and the Argentine Seep exceeded the derived WQBELs.

Note 9: Adjustments were made to the acute dissolved nickel allocations by deducting 3.373 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 10: Adjustments were made to the acute dissolved selenium allocations by deducting 0.045 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 11: Adjustments were made to the acute dissolved silver allocations by deducting 0.043 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 12: Adjustments were made to the acute dissolved zinc allocations by deducting 2.234 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available available assimilative loadings were not adequate and thus the maximum concentrations being discharged by all point sources exceeded the derived WQBELs.

Table A-18
Chronic Assimilative Capacities for Metals for Scenario 2

Parameter	St. Louis Ponds WQBELs (Jan-Mar)	St. Louis Ponds WQBELs (Apr-Sep)	St. Louis Ponds WQBELs (Oct-Dec)	Blaine Adit WQBELs	Argentine Seep WQBELs	Columbia Tailings Seep WQBELs	Rico Boy Adit WQBELs	Santa Cruz Adit WQBELs	Silver Swan Adit WQBELs	Notes
As, Trec (ug/l)	296	419	273	0	50	100	100	100	100	1,2
Cd, Dis (ug/l)	8.4	13	7.8	0	5.5	6.2	6.2	6.2	6.2	3
Cr^{+3}, Trec (ug/l)	295	417	272	0	50	100	100	100	100	2,4
Cr^{+6}, Dis (ug/l)	32	46	30	0	11	11	11	11	11	5
Cu, Dis (ug/l)	36	54	34	0	29	29	29	29	29	6
CN, Free (ug/l)	NA	NA	NA	0	NA	NA	NA	NA	NA	
Fe, Trec (ug/l)	1221	1646	1189	0	1000	1000	1000	1000	1000	7
Pb, Dis (ug/l)	10	16	9.3	0	11	11	11	11	11	8
Mn, Dis (ug/l)	5517	7985	5107	0	2618	2618	2618	2618	2618	9
Hg, Tot (ug/l)	0.029	0.042	0.027	0	0.010	0.010	0.010	0.010	0.010	10
Ni, Dis (ug/l)	220	328	203	0	168	168	168	168	168	11
Se, Dis (ug/l)	12	18	12	0	4.6	4.6	4.6	4.6	4.6	12
Ag, Dis (ug/l)	1.9	3.0	1.7	0	0.81	3.5	3.5	3.5	3.5	13
Zn, Dis (ug/l)	334	622	313	0	382	382	382	382	382	14

Note 1: Adjustments were made to the chronic total recoverable arsenic allocations by deducting 0.037 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 2: Although no chronic standard is in place for the Argentine Seep for the noted parameters, an available assimilative loading was determined and WQBELs assigned to ensure that adequate downstream assimilative capacities are available

Note 3: Adjustments were made to the chronic dissolved cadmium allocations by deducting 0.012 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 4: Adjustments were made to the chronic dissolved trivalent chromium allocations by deducting 0.037 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 5: Adjustments were made to the chronic dissolved hexavalent chromium allocations by deducting 0.008 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 6: Adjustments were made to the chronic dissolved copper allocations by deducting 0.05 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Columbia Tailings Seep exceeded the derived WQBEL.

Note 7: Adjustments were made to the chronic total recoverable iron allocations by deducting 3.227 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the Rico Boy Adit and the Silver Swan Adit exceeded the derived WQBELs.

Note 8: Adjustments were made to the chronic dissolved lead allocations by deducting 0.027 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 9: Adjustments were made to the chronic dissolved manganese allocations by deducting 3.29 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available assimilative loadings were not adequate and thus the maximum concentrations being discharged by the Argentine Seep and the Columbia Tailings Seep exceeded the derived WQBELs.

Note 10: Adjustments were made to the chronic total mercury allocations by deducting 0.00001 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Silver Swan Adit exceeded the derived WQBEL.

Note 11: Adjustments were made to the chronic dissolved nickel allocations by deducting 0.27 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 12: Adjustments were made to the chronic dissolved selenium allocations by deducting 0.004 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Columbia Tailings Seep exceeded the derived WQBEL.

Note 13: Adjustments were made to the chronic dissolved silver allocations by deducting 0.005 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 14: Adjustments were made to the chronic dissolved zinc allocations by deducting 2.201 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available available assimilative loadings were not adequate and thus the maximum concentration being discharged by all point sources exceeded the derived WQBELs.

Table A-19
Acute Assimilative Capacities for Metals and Cyanide for Scenario 2

Parameter	St. Louis Ponds WQBELs (Jan-Mar)	St. Louis Ponds WQBELs (Apr-Sep)	St. Louis Ponds WQBELs (Oct-Dec)	Blaine Adit WQBELs	Argentine Seep WQBELs	Columbia Tailings Seep WQBELs	Rico Boy Adit WQBELs	Santa Cruz Adit WQBELs	Silver Swan Adit WQBELs	Notes
As, Trec (ug/l)	NA	NA	NA	0	50	NA	NA	NA	NA	1
Cd, Dis (ug/l)	15	29	14	0	17	19	19	19	19	2
Cr^{+3}, Trec (ug/l)	NA	NA	NA	0	50	NA	NA	NA	NA	1
Cr^{+6}, Dis (ug/l)	38	66	35	0	16	16	16	16	16	4
Cu, Dis (ug/l)	46	85	42	0	50	50	50	50	50	5
CN, Free (ug/l)	12	21	11	0	5.0	5.0	5.0	5.0	5.0	6
Fe, Trec (ug/l)	NA	NA	NA	0	NA	NA	NA	NA	NA	
Pb, Dis (ug/l)	240	450	218	0	281	281	281	281	281	7
Mn, Dis (ug/l)	8165	14376	7427	0	4738	4738	4738	4738	4738	8
Hg, Tot (ug/l)	NA	NA	NA	0	NA	NA	NA	NA	NA	
Ni, Dis (ug/l)	1590	2926	1446	0	1513	1513	1513	1513	1513	9
Se, Dis (ug/l)	43	74	39	0	18	18	18	18	18	10
Ag, Dis (ug/l)	9	19	8	0	20	22	22	22	22	11
Zn, Dis (ug/l)	268	628	245	0	379	379	379	379	379	12

Note 1: No adjustments were made to the allocations for the indicated parameters because the available assimilative capacities are adequate to accomodate the derived WQBELs and the derived WQBELs are greater than the maximum concentration of the indicated parameters being discharged at each point source.

Note 2: Adjustments were made to the acute dissolved cadmium allocations by deducting 0.041 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Rico Boy Adit exceeded the derived WQBEL.

Note 3: Adjustments were made to the acute dissolved trivalent chromium allocations by deducting 3.634 lbs/day from the available assimilative loadings for the St. Louis Ponds. Note that although no standard is in place for dissolved trivalent chromium at the Argentine Seep, an available assimilative loading was determined and WQBELs assigned to ensure that adequate downstream assimilative capacities are available.

Note 4: Adjustments were made to the acute dissolved hexavalent chromium allocations by deducting 0.028 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 5: Adjustments were made to the acute dissolved copper allocations by deducting 0.097 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Columbia Tailings Seep exceeded the derived WQBEL.

Note 6: Adjustments were made to the acute free cyanide allocations by deducting 0.009 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 7: Adjustments were made to the acute dissolved lead allocations by deducting 0.571 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 8: Adjustments were made to the acute dissolved manganese allocations by deducting 9.327 lbs/day from the available assimilative loadings for the St. Louis Ponds. The available assimilative loading was not adequate and thus the maximum concentration being discharged by the Argentine Seep exceeded the derived WQBEL.

Note 9: Adjustments were made to the acute dissolved nickel allocations by deducting 3.105 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 10: Adjustments were made to the acute dissolved selenium allocations by deducting 0.033 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 11: Adjustments were made to the acute dissolved silver allocations by deducting 0.043 lbs/day from the available assimilative loadings for the St. Louis Ponds.

Note 12: Adjustments were made to the acute dissolved zinc allocations by deducting 2.031 lbs/day from the available assimilative loadings for the St. Louis Ponds. Available available assimilative loadings were not adequate and thus the maximum concentration being discharged by all point sources exceeded the derived WQBELs.

V. Antidegradation Review

As set out in *The Basic Standards and Methodologies for Surface Water*, Section 31.8(2)(b), an antidegradation analysis is required except in cases where the receiving water is designated as "Use Protected." Note that "Use Protected" waters are waters "that the Commission has determined do not warrant the special protection provided by the outstanding waters designation or the antidegradation review process" as set out in Section 31.8(2)(b). The antidegradation section of the regulation became effective in December 2000, and therefore antidegradation considerations are applicable to this WQA development.

According to the *Classifications and Numeric Standards for San Juan River and Dolores River Basins*, stream segment COSJDO09 is Use Protected. Because the receiving waters are designated as Use Protected, no antidegradation review is necessary in accordance with the regulations. Thus, for purposes of this WQA, antidegradation review requirements have been met for the Blaine Adit.

According to the *Classifications and Numeric Standards for San Juan River and Dolores River Basins*, stream segments COSJDO03 and COSJDO05 are Undesignated. Thus, an antidegradation review is required for these segments if new or increased impacts are found to occur.

Consistent with current WQCD procedures, the baseline water quality (BWQ) for pollutants of concern should be established so that it can be used as part of antidegradation reviews. BWQ is defined by the WQCD as the condition of the water quality as of September 30, 2000. Furthermore, the WQCD specifies that BWQ will include the influence of the discharger if it was in place on September 30, 2000. Accordingly, the BWQ is calculated based on the following equation:

$$BWQ = \frac{M_{eff}Q_{eff} + M_{u/s}Q_{u/s}}{Q_{eff} + Q_{u/s}}$$

where:

BWQ = Baseline water quality concentration
$Q_{u/s}$ = Upstream chronic low flow (30E3)
$M_{u/s}$ = Upstream background pollutant concentration at the existing quality
Q_{eff} = 2-year average flow
M_{eff}= 2-year average effluent pollutant concentration

For purposes of establishing BWQs when low flows are equal to zero, a modified version of the equation above is used. When the upstream low flow, $Q_{u/s}$, is zero, the following results:

$$BWQ = M_{eff}$$

The antidegradation requirements outlined in *The Basic Standards and Methodologies for Surface Water* specify that chronic numeric standards be used; however, where there is only an acute standard, the acute standard and low flow should be used. Chronic standards were available for all pollutants except cyanide, total recoverable arsenic and total recoverable chromium for Scenarios 1 and 2. Thus, the chronic low flows summarized in Section III of this WQA were used for $Q_{u/s}$ for all parameters, except that the acute low flows were used for the $Q_{u/s}$ when establishing the BWQ for cyanide, total recoverable arsenic and total recoverable chromium for Scenarios 1 and 2.

Currently, it is the WQCD's approach to evaluate five years of ambient water quality data and effluent data, if available, for the time frame prior to September 30, 2000. Ambient water quality data summarized in Section II of this WQA were used to define the $M_{u/s}$. Doing so conforms to the WQCD's approach in establishing $M_{u/s}$ on the basis of review of five years of ambient water quality data, or a comparable time frame if five years of data were not available.

To determine the Q_{eff} and M_{eff} for these discharges, the WQCD's AD guidance was consulted. According to the guidance, if a discharge was in place before September 30, 2000 but was not permitted, the BWQ concentrations are calculated with Q_{eff} and M_{eff} equal to zero. However, the guidance indicates that the WQCD may grant exceptions to this on a case-by-case basis for certain historic discharges like draining mine adits. Although these discharges are not currently permitted under an effective CDPS discharge permit, there has been historic discharge from these mine adits and seeps and therefore it is the WQCD's approach to allow existing discharge data to be used in the establishment of Q_{eff} and M_{eff}.

The determination of the average effluent flows for all discharges was discussed previously in Section III of this WQA, and these flows were used to establish the Q_{eff} for each discharge.

The mean effluent discharge data were used to establish the M_{eff} consistent with the AD guidance and these mean effluent data along with the 15th, 50th, and 85th percentile and the maximum effluent quality are summarized in Tables A-20 through A-25. The data evaluated were limited to the data that were available for the antidegradation review period from October 1, 1995 through September 30, 2000. The exception is the Argentine Seep in which post-VCUP data through September 30, 2000 were used. Specifically, the following periods of record were available and were used:

- St. Louis Ponds: October 1999 through April 2000
- Silver Swan Adit: October 1995 through July 1997
- Rico Boy Adit: October 1995 through July 1997
- Santa Cruz Adit: October 1995 through July 1997
- Argentine Seep: October 1996 through July 1997

For the Columbia Tailings Seep, there were no data that were available to represent the average effluent quality of the Seep without the influence of the dilution of the side channel of the Dolores River. In the absence of effluent data, the downstream sampling of the side channel of the Dolores River was used to represent the average effluent quality of the Columbia Tailings Seep. Data from this location were available for a period of record from October 1996 through April 1997.

Pursuant to the approach discussed above, the equation for BWQ, and the available data, the BWQ concentrations for pollutants of concern have been calculated. These are set forth in Tables A-26 through A-34. Note that when the calculated BWQ concentration exceeds the water quality standard, the BWQ concentration must be set equal to the water quality standard. Where this occurred, the calculated BWQ concentration and the WQS are highlighted in ***bold and italicized*** characters.

Table A-20 Effluent Discharge Data for the St. Louis Ponds							
Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Max*	*Notes*
As, Trec (ug/l)	1	0	0	0	0	0	
Cd, Dis (ug/l)	2	6.3	7.3	8.3	7.3	8.7	
Cr^{+3}, Trec (ug/l)	1	0	0	0	0	0	
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	0	1
Cu, Dis (ug/l)	2	0	0	0	0	0	
CN, Free (ug/l)	0	0	0	0	0	0	1
Fe, Trec (ug/l)	3	530	717	915	722	1000	
Pb, Dis (ug/l)	2	0.14	0.45	0.77	0.45	0.90	
Mn, Dis (ug/l)	2	1741	1835	1930	1835	1970	
Hg, Tot (ug/l)	1	0	0	0	0	0	
Ni, Dis (ug/l)	0	0	0	0	0	0	1
Se, Dis (ug/l)	0	0	0	0	0	0	1
Ag, Dis (ug/l)	2	0.083	0.16	0.24	0.16	0.27	
Zn, Dis (ug/l)	2	1647	2200	2753	2200	2990	
Note 1: In the absence of data for these parameters at this location, a concentration of zero was used.							

Table A-21 Effluent Discharge Data for the Silver Swan Adit							
Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Max*	*Notes*
As, Trec (ug/l)	4	0	1.5	34	16	59	
Cd, Dis (ug/l)	7	0.71	1.0	1.3	1.0	1.5	
Cr^{+3}, Trec (ug/l)	0	0	0	0	0	0	1
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	0	1
Cu, Dis (ug/l)	7	0	0	0	0	0	
CN, Free (ug/l)	0	0	0	0	0	0	1
Fe, Trec (ug/l)	3	3625	7580	8315	6047	8630	
Pb, Dis (ug/l)	7	3.9	6.0	6.7	5.4	7.6	
Mn, Dis (ug/l)	7	864	1340	1682	1252	1700	
Hg, Tot (ug/l)	4	0.014	0.065	0.21	0.11	0.30	
Ni, Dis (ug/l)	0	0	0	0	0	0	1
Se, Dis (ug/l)	0	0	0	0	0	0	1
Ag, Dis (ug/l)	7	0	0	0.0050	0.0071	0.050	
Zn, Dis (ug/l)	7	485	723	885	665	903	
Note 1: In the absence of data for these parameters at this location, a concentration of zero was used.							

Table A-22

Effluent Discharge Data for the Rico Boy Adit

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Max*	*Notes*
As, Trec (ug/l)	0	0	0	0	0	0	1
Cd, Dis (ug/l)	7	15	17	21	18	24	
Cr^{+3}, Trec (ug/l)	0	0	0	0	0	0	1
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	0	1
Cu, Dis (ug/l)	7	0	0	0	0	0	
CN, Free (ug/l)	0	0	0	0	0	0	1
Fe, Trec (ug/l)	3	177	272	2623	1346	3630	
Pb, Dis (ug/l)	7	0	0	2.7	1.2	6.0	
Mn, Dis (ug/l)	7	880	945	1336	1113	1930	
Hg, Tot (ug/l)	0	0	0	0	0	0	1
Ni, Dis (ug/l)	0	0	0	0	0	0	1
Se, Dis (ug/l)	0	0	0	0	0	0	1
Ag, Dis (ug/l)	7	0	0	0.0070	0.010	0.070	
Zn, Dis (ug/l)	7	6867	8550	9302	7447	9860	

Note 1: In the absence of data for these parameters at this location, a concentration of zero was used.

Table A-23

Effluent Discharge Data for the Santa Cruz Adit

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Max*	*Notes*
As, Trec (ug/l)	0	0	0	0	0	0	1
Cd, Dis (ug/l)	7	2.0	2.2	2.8	2.4	3.5	
Cr^{+3}, Trec (ug/l)	0	0	0	0	0	0	1
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	0	1
Cu, Dis (ug/l)	7	14	16	21	16	21	
CN, Free (ug/l)	0	0	0	0	0	0	1
Fe, Trec (ug/l)	3	204	217	253	228	268	
Pb, Dis (ug/l)	7	0	0	0.22	0.064	0.23	
Mn, Dis (ug/l)	7	178	203	361	252	396	
Hg, Tot (ug/l)	0	0	0	0	0	0	1
Ni, Dis (ug/l)	0	0	0	0	0	0	1
Se, Dis (ug/l)	0	0	0	0	0	0	1
Ag, Dis (ug/l)	7	0	0	0.035	0.016	0.080	
Zn, Dis (ug/l)	7	1196	1220	1327	1267	1480	

Note 1: In the absence of data for these parameters at this location, a concentration of zero was used.

Table A-24

Effluent Discharge Data for the Argentine Seep

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Max*	*Notes*
As, Trec (ug/l)	0	0	0	0	0	0	1
Cd, Dis (ug/l)	4	0.54	0.67	2.2	1.3	3.5	
Cr^{+3}, Trec (ug/l)	0	0	0	0	0	0	1
Cr^{+6}, Dis (ug/l)	0	0	0	0	0	0	1
Cu, Dis (ug/l)	4	0	0	0	0	0	
CN, Free (ug/l)	2	0	0	0	0	0	
Fe, Trec (ug/l)	0	372	375	379	375	380	2
Pb, Dis (ug/l)	4	1.1	1.6	4.1	2.5	5.9	
Mn, Dis (ug/l)	4	5107	6250	7668	6375	8010	
Hg, Tot (ug/l)	0	0	0	0	0	0	1
Ni, Dis (ug/l)	0	0	0	0	0	0	1
Se, Dis (ug/l)	0	0	0	0	0	0	1
Ag, Dis (ug/l)	4	0	0	0	0	0	
Zn, Dis (ug/l)	4	5079	5710	6330	5705	6690	

Note 1: In the absence of data for these parameters at this location, a concentration of zero was used.

Note 2: In the absence of data for this parameter at this location, data from the side channel of the Dolores River near the Columbia Tailings were used.

Table A-25

Downstream Ambient Water Quality Data for the Columbia Tailings Seep

Parameter	*Number of Samples*	*15th Percentile*	*50th Percentile*	*85th Percentile*	*Mean*	*Max*	*Notes*
As, Trec (ug/l)	0	0	0	0	0	0	1
Cd, Dis (ug/l)	3	5.1	5.3	9.1	7.0	11	
Cr^{+3}, Trec (ug/l)	0	0.50	0.50	0.50	0.50	0.50	2
Cr^{+6}, Dis (ug/l)	1	0	0	0	0	0	1
Cu, Dis (ug/l)	3	14.0	15	47	30	61	
CN, Free (ug/l)	1	0	0	0	0	0	
Fe, Trec (ug/l)	0	372	375	379	375	380	2
Pb, Dis (ug/l)	3	0.75	1.10	2.3	1.50	2.8	
Mn, Dis (ug/l)	3	1443	1660	2864	2130	3380	
Hg, Tot (ug/l)	0	0	0	0	0	0	1
Ni, Dis (ug/l)	0	0	0	0	0	0.55	2
Se, Dis (ug/l)	0	1.2	2.8	4.3	2.8	5.0	2
Ag, Dis (ug/l)	3	0	0	0	0	0	2
Zn, Dis (ug/l)	3	1852	1950	3658	2717	4390	

Note 1: In the absence of data for these parameters at this location, a concentration of zero was used.

Table A-26 Baseline Water Quality Concentrations for the St. Louis Ponds (Jan-Mar)						
Pollutant	***M_{eff}***	***Q_{eff} (cfs)***	***$M_{u/s}$***	***$Q_{u/s}$ (cfs)***	***BWQ***	***WQS***
As, Trec (ug/l)	0	2.0	0.50	4.0	0.33	100
Cd, Dis (ug/l)	7.3	2.0	0.38	4.0	2.7	3.3
Cr^{+3}, Trec (ug/l)	0	2.0	1.0	4.0	0.63	100
Cr^{+6}, Dis (ug/l)	0	2.0	0	4.0	0	11
Cu, Dis (ug/l)	0	2.0	0.60	4.0	0.40	14
CN, Free (ug/l)	0	2.0	0	3.1	0	5.0
Fe, Trec (ug/l)	722	2.0	740	4.0	734	1000
Pb, Dis (ug/l)	0.45	2.0	0.79	4.0	0.68	4.5
Mn, Dis (ug/l)	1835	2.0	364	4.0	854	1972
Hg, Tot (ug/l)	0	2.0	0	4.0	0	0.010
Ni, Dis (ug/l)	0	2.0	0.66	4.0	0.44	82
Se, Dis (ug/l)	0	2.0	0.50	4.0	0.33	4.6
Ag, Dis (ug/l)	0.16	2.0	0.34	4.0	0.28	0.81
Zn, Dis (ug/l)	2200	2.0	9.9	4.0	***740***	***186***

Table A-27 Baseline Water Quality Concentrations for the St. Louis Ponds (Apr-Sep)						
Pollutant	***M_{eff}***	***Q_{eff} (cfs)***	***$M_{u/s}$***	***$Q_{u/s}$ (cfs)***	***BWQ***	***WQS***
As, Trec (ug/l)	0	3.1	0.50	10	0.38	100
Cd, Dis (ug/l)	7.3	3.1	0.38	10	2.0	3.3
Cr^{+3}, Trec (ug/l)	0	3.1	0.95	10	0.73	100
Cr^{+6}, Dis (ug/l)	0	3.1	0	10	0	11
Cu, Dis (ug/l)	0	3.1	0.60	10	0.46	14
CN, Free (ug/l)	0	3.1	0	10	0	5.0
Fe, Trec (ug/l)	722	3.1	740	10	736	1000
Pb, Dis (ug/l)	0.45	3.1	0.79	10	0.71	4.5
Mn, Dis (ug/l)	1835	3.1	364	10	712	1972
Hg, Tot (ug/l)	0	3.1	0	10	0	0.010
Ni, Dis (ug/l)	0	3.1	0.66	10	0.50	82
Se, Dis (ug/l)	0	3.1	0.50	10	0.38	4.6
Ag, Dis (ug/l)	0.16	3.1	0.34	10	0.30	0.81
Zn, Dis (ug/l)	2200	3.1	9.9	10	***528***	***186***

Table A-28 Baseline Water Quality Concentrations for the St. Louis Ponds (Oct-Dec)						
Pollutant	***M_{eff}***	***Q_{eff} (cfs)***	***$M_{u/s}$***	***$Q_{u/s}$ (cfs)***	***BWQ***	***WQS***
As, Trec (ug/l)	0	2.2	0.50	3.9	0.32	100
Cd, Dis (ug/l)	7.3	2.2	0.38	3.9	2.9	3.3
Cr^{+3}, Trec (ug/l)	0	2.2	0.95	3.9	0.61	100
Cr^{+6}, Dis (ug/l)	0	2.2	0	3.9	0	11
Cu, Dis (ug/l)	0	2.2	0.60	3.9	0.38	14
CN, Free (ug/l)	0	2.2	0	2.9	0	5.0
Fe, Trec (ug/l)	722	2.2	740	3.9	734	1000
Pb, Dis (ug/l)	0.45	2.2	0.79	3.9	0.67	4.5
Mn, Dis (ug/l)	1835	2.2	364	3.9	895	1972
Hg, Tot (ug/l)	0	2.2	0	3.9	0	0.010
Ni, Dis (ug/l)	0	2.2	0.66	3.9	0.42	82
Se, Dis (ug/l)	0	2.2	0.50	3.9	0.32	4.6
Ag, Dis (ug/l)	0.16	2.2	0.34	3.9	0.28	0.81
Zn, Dis (ug/l)	2200	2.2	9.9	3.9	***800***	***186***

Table A-29 Baseline Water Quality Concentrations for the Silver Swan Adit						
Pollutant	***M_{eff}***	***Q_{eff} (cfs)***	***$M_{u/s}$***	***$Q_{u/s}$ (cfs)***	***BWQ***	***WQS***
As, Trec (ug/l)	16	0.10	0	0	16	100
Cd, Dis (ug/l)	1.0	0.10	0	0	1.0	6.2
Cr^{+3}, Trec (ug/l)	0	0.10	0	0	0	100
Cr^{+6}, Dis (ug/l)	0	0.10	0	0	0	11
Cu, Dis (ug/l)	0	0.10	0	0	0	29
CN, Free (ug/l)	0	0.10	0	0	0	5.0
Fe, Trec (ug/l)	6047	0.10	0	0	***6047***	***1000***
Pb, Dis (ug/l)	5.4	0.10	0	0	5.4	11
Mn, Dis (ug/l)	1252	0.10	0	0	1252	2618
Hg, Tot (ug/l)	0.11	0.10	0	0	***0.11***	***0.010***
Ni, Dis (ug/l)	0	0.10	0	0	0	168
Se, Dis (ug/l)	0	0.10	0	0	0	4.6
Ag, Dis (ug/l)	0.0071	0.10	0	0	0.0071	3.5
Zn, Dis (ug/l)	665	0.10	0	0	***665***	***382***

Table A-30
Baseline Water Quality Concentrations for the Rico Boy Adit

Pollutant	M_{eff}	Q_{eff} (cfs)	$M_{u/s}$	$Q_{u/s}$ (cfs)	*BWQ*	*WQS*
As, Trec (ug/l)	0	0.0078	0	0	0	100
Cd, Dis (ug/l)	18	0.0078	0	0	*18*	*6.2*
Cr^{+3}, Trec (ug/l)	0	0.0078	0	0	0	100
Cr^{+6}, Dis (ug/l)	0	0.0078	0	0	0	11
Cu, Dis (ug/l)	0	0.0078	0	0	0	29
CN, Free (ug/l)	0	0.0078	0	0	0	5.0
Fe, Trec (ug/l)	1346	0.0078	0	0	*1346*	*1000*
Pb, Dis (ug/l)	1.2	0.0078	0	0	1.2	11
Mn, Dis (ug/l)	1113	0.0078	0	0	1113	2618
Hg, Tot (ug/l)	0	0.0078	0	0	0	0.010
Ni, Dis (ug/l)	0	0.0078	0	0	0	168
Se, Dis (ug/l)	0	0.0078	0	0	0	4.6
Ag, Dis (ug/l)	0.010	0.0078	0	0	0.010	3.5
Zn, Dis (ug/l)	7447	0.0078	0	0	*7447*	*382*

Table A-31
Baseline Water Quality Concentrations for the Santa Cruz Adit

Pollutant	M_{eff}	Q_{eff} (cfs)	$M_{u/s}$	$Q_{u/s}$ (cfs)	*BWQ*	*WQS*
As, Trec (ug/l)	0	0.049	0	0	0	100
Cd, Dis (ug/l)	2.4	0.049	0	0	2.4	6.2
Cr^{+3}, Trec (ug/l)	0	0.049	0	0	0	100
Cr^{+6}, Dis (ug/l)	0	0.049	0	0	0	11
Cu, Dis (ug/l)	16	0.049	0	0	16	29
CN, Free (ug/l)	0	0.049	0	0	0	5.0
Fe, Trec (ug/l)	228	0.049	0	0	228	1000
Pb, Dis (ug/l)	0.064	0.049	0	0	0.064	11
Mn, Dis (ug/l)	252	0.049	0	0	252	2618
Hg, Tot (ug/l)	0	0.049	0	0	0	0.010
Ni, Dis (ug/l)	0	0.049	0	0	0	168
Se, Dis (ug/l)	0	0.049	0	0	0	4.6
Ag, Dis (ug/l)	0.016	0.049	0	0	0.016	3.5
Zn, Dis (ug/l)	1267	0.049	0	0	*1267*	*382*

Table A-32
Baseline Water Quality Concentrations for the Argentine Seep

Pollutant	M_{eff}	Q_{eff} (cfs)	$M_{u/s}$	$Q_{u/s}$ (cfs)	*BWQ*	*WQS*
As, Trec (ug/l)	0	0.11	0	0	0	50
Cd, Dis (ug/l)	1.3	0.11	0	0	1.3	6.2
Cr^{+3}, Trec (ug/l)	0	0.11	0	0	0	50
Cr^{+6}, Dis (ug/l)	0	0.11	0	0	0	11
Cu, Dis (ug/l)	0	0.11	0	0	0	29
CN, Free (ug/l)	0	0.11	0	0	0	5.0
Fe, Trec (ug/l)	375	0.11	0	0	375	1000
Pb, Dis (ug/l)	3	0.11	0	0	2.5	11
Mn, Dis (ug/l)	6375	0.11	0	0	***6375***	***2618***
Hg, Tot (ug/l)	0	0.11	0	0	0	0.010
Ni, Dis (ug/l)	0	0.11	0	0	0	168
Se, Dis (ug/l)	0	0.11	0	0	0	4.6
Ag, Dis (ug/l)	0	0.11	0	0	0	3.5
Zn, Dis (ug/l)	5705	0.11	0	0	***5705***	***382***

Table A-33
Baseline Water Quality Concentrations for the Columbia Tailings Seep

Pollutant	M_{eff}	Q_{eff} (cfs)	$M_{u/s}$	$Q_{u/s}$ (cfs)	*BWQ*	*WQS*
As, Trec (ug/l)	0.40	0.053	0	0	0.40	100
Cd, Dis (ug/l)	7.0	0.053	0	0	***7.0***	***6.2***
Cr^{+3}, Trec (ug/l)	0.50	0.053	0	0	0.50	100
Cr^{+6}, Dis (ug/l)	0	0.053	0	0	0	11
Cu, Dis (ug/l)	30	0.053	0	0	***30***	***29***
CN, Free (ug/l)	0	0.053	0	0	0	5.0
Fe, Trec (ug/l)	375	0.053	0	0	375	1000
Pb, Dis (ug/l)	1.5	0.053	0	0	1.5	11
Mn, Dis (ug/l)	2130	0.053	0	0	2130	2618
Hg, Tot (ug/l)	0	0.053	0	0	0	0
Ni, Dis (ug/l)	0.28	0.053	0	0	0.28	168
Se, Dis (ug/l)	2.8	0.053	0	0	2.8	4.6
Ag, Dis (ug/l)	0	0.053	0	0	0	3.5
Zn, Dis (ug/l)	2717	0.053	0	0	***2717***	***382***

New or increased impacts on the receiving stream would be expected to result from any permit issuance because the calculated WQBELs are greater than the current permit limits, which are implied to be zero, because the discharges are not currently permitted. Thus, the antidegradation review procedure must continue to determine if the impacts are significant.

Impacts are deemed to be significant if the calculated WQBEL exceeds the calculated antidegradation-based average concentration (ADBAC). The ADBAC limit is a two-year rolling average limit, which means that while an ADBAC limit will remain the same throughout the life of a permit, the permittee will determine compliance each month with the ADBAC limit by averaging the two years of data preceding the month for which compliance is being determined.

ADBACs are calculated using the significant concentration threshold (SCT), which is the additional amount of pollutant above the BWQ that would not cause significant degradation. Section 31.8 (3)(c) specifies that the discharge of pollutants should not be considered to result in significant degradation of the reviewable waters if one of the following summarized conditions is met:

- For bioaccumulative toxic pollutants, the new or increased loading from the source under review is less than 10 percent of the existing total load to that portion of the segment impacted.
- For all other pollutants
  - the flow rate is greater than 100:1 dilution at low flow; or
  - the new effluent load is less than 15 percent of the remaining assimilative capacity; or
  - only a temporary change in water quality will result.

The SCT for most pollutants equals the BWQ plus 15 percent of the remaining assimilative capacity, and is calculated by the following equation:

$$SCT = 0.15 \times (WQS - BWQ) + BWQ$$

For total mercury, which is a bioaccumulative toxic pollutant, a threshold load must be determined and extensive evaluation must be conducted to ensure that there is no more than a 10% increase over baseline water quality. For most dischargers, the BWQ is equal to zero and therefore no incremental increase is allowed. For the Silver Swan Adit, the BWQ is greater than the current water quality standard and thus no incremental increase will be allowed.

ADBACs are then determined by re-calculating the mass-balance equation using the SCT in place of the water quality standard, as in the following equation:

$$ADBAC = \frac{SCT \times Q_3 - M_1 Q_1}{Q_2}$$

where:

Q_1	=	Upstream low flow (1E3 or 30E3)
Q_2	=	Average daily effluent flow (design capacity)
Q_3	=	Downstream flow ($Q_1 + Q_2$)
M_1	=	Ambient existing water quality concentration (From Section II)
SCT	=	Significant concentration threshold

The SCTs and ADBACs for pollutants of concern are calculated for Scenarios 1 and 2 and are provided in the Tables A-34 through A-41.

Table A-34
SCTs and ADBACs for the St. Louis Ponds (Jan-Mar)

Pollutant	*SCT*	M_1	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	*ADBAC*
As, Trec (ug/l)	15	0.50	4.0	2.0	6.0	*44*
Cd, Dis (ug/l)	2.8	0.38	4.0	2.0	6.0	*7.6*
Cr^{+3}, Trec (ug/l)	16	0.95	4.0	2.0	6.0	*46*
Cr^{+6}, Dis (ug/l)	1.7	0	4.0	2.0	6.0	*5.1*
Cu, Dis (ug/l)	2.4	0.60	4.0	2.0	6.0	*6.0*
CN, Free (ug/l)	0.75	0	3.1	2.0	5.1	*1.9*
Fe, Trec (ug/l)	774	740	4.0	2.0	6.0	*842*
Pb, Dis (ug/l)	1.3	0.79	4.0	2.0	6.0	*2.3*
Mn, Dis (ug/l)	1022	364	4.0	2.0	6.0	*2,338*
Hg, Tot (ug/l)	0	0	4.0	2.0	6.0	-
Ni, Dis (ug/l)	13	0.66	4.0	2.0	6.0	*38*
Se, Dis (ug/l)	0.97	0.50	4.0	2.0	6.0	*1.9*
Ag, Dis (ug/l)	0.36	0.34	4.0	2.0	6.0	*0.40*
Zn, Dis (ug/l)	186	9.9	4.0	2.0	6.0	*538*

Table A-35
SCTs and ADBACs for the St. Louis Ponds (Apr-Sep)

Pollutant	*SCT*	M_1	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	*ADBAC*
As, Trec (ug/l)	15	0.50	4.0	3.1	7.1	*34*
Cd, Dis (ug/l)	2.2	0.38	4.0	3.1	7.1	*4.5*
Cr^{+3}, Trec (ug/l)	16.0	0.95	4.0	3.1	7.1	*35*
Cr^{+6}, Dis (ug/l)	1.7	0	4.0	3.1	7.1	*3.9*
Cu, Dis (ug/l)	2.5	0.60	4.0	3.1	7.1	*5.0*
CN, Free (ug/l)	0.75	0	3.1	3.1	6.2	*1.5*
Fe, Trec (ug/l)	776	740	4.0	3.1	7.1	*822*
Pb, Dis (ug/l)	1.3	0.79	4.0	3.1	7.1	*2.0*
Mn, Dis (ug/l)	901	364	4.0	3.1	7.1	*1,594*
Hg, Tot (ug/l)	0	0	4.0	3.1	7.1	-
Ni, Dis (ug/l)	13	0.66	4.0	3.1	7.1	*29*
Se, Dis (ug/l)	1.0	0.50	4.0	3.1	7.1	*1.6*
Ag, Dis (ug/l)	0.38	0.34	4.0	3.1	7.1	*0.43*
Zn, Dis (ug/l)	186	9.9	4.0	3.1	7.1	*413*

Table A-36 SCTs and ADBACs for the St. Louis Ponds (Oct-Dec)						
Pollutant	***SCT***	***M_1***	***Q_1 (cfs)***	***Q_2 (cfs)***	***Q_3 (cfs)***	***ADBAC***
As, Trec (ug/l)	15	0.50	3.9	2.2	6.1	***41***
Cd, Dis (ug/l)	3.0	0.38	3.9	2.2	6.1	***7.6***
Cr^{+3}, Trec (ug/l)	16	0.95	3.9	2.2	6.1	***42.7***
Cr^{+6}, Dis (ug/l)	1.7	0	3.9	2.2	6.1	***4.7***
Cu, Dis (ug/l)	2.4	0.60	3.9	2.2	6.1	***5.6***
CN, Free (ug/l)	0.75	0	2.9	2.2	5.1	***1.7***
Fe, Trec (ug/l)	774	740	3.9	2.2	6.1	***834***
Pb, Dis (ug/l)	1.2	0.79	3.9	2.2	6.1	***1.9***
Mn, Dis (ug/l)	1057	364	3.9	2.2	6.1	***2,286***
Hg, Tot (ug/l)	0	0	3.9	2.2	6.1	***-***
Ni, Dis (ug/l)	13	0.66	3.9	2.2	6.1	***35***
Se, Dis (ug/l)	0.96	0.50	3.9	2.2	6.1	***1.8***
Ag, Dis (ug/l)	0.36	0.34	3.9	2.2	6.1	***0.40***
Zn, Dis (ug/l)	186	9.9	3.9	2.2	6.1	***498***

Table A-37 SCTs and ADBACs for the Silver Swan Adit						
Pollutant	***SCT***	***M_1***	***Q_1 (cfs)***	***Q_2 (cfs)***	***Q_3 (cfs)***	***ADBAC***
As, Trec (ug/l)	29	0	0	0.10	0.10	***29***
Cd, Dis (ug/l)	1.8	0	0	0.10	0.10	***1.8***
Cr^{+3}, Trec (ug/l)	15	0	0	0.10	0.10	***15***
Cr^{+6}, Dis (ug/l)	1.7	0	0	0.10	0.10	***1.7***
Cu, Dis (ug/l)	4.4	0	0	0.10	0.10	***4.4***
CN, Free (ug/l)	0.75	0	0	0.10	0.10	***0.75***
Fe, Trec (ug/l)	1000	0	0	0.10	0.10	***1,000***
Pb, Dis (ug/l)	6.2	0	0	0.10	0.10	***6.2***
Mn, Dis (ug/l)	1457	0	0	0.10	0.10	***1,457***
Hg, Tot (ug/l)	0.010	0	0	0.10	0.10	***0.010***
Ni, Dis (ug/l)	25	0	0	0.10	0.10	***25***
Se, Dis (ug/l)	0.69	0	0	0.10	0.10	***0.69***
Ag, Dis (ug/l)	0.53	0	0	0.10	0.10	***0.53***
Zn, Dis (ug/l)	382	0	0	0.10	0.10	***382***

Table A-38
SCTs and ADBACs for the Rico Boy Adit

Pollutant	*SCT*	M_1	Q_1 *(cfs)*	Q_2 *(cfs)*	Q_3 *(cfs)*	*ADBAC*
As, Trec (ug/l)	15	0	0	0.0078	0.0078	***15***
Cd, Dis (ug/l)	6.2	0	0	0.0078	0.0078	***6.2***
Cr^{+3}, Trec (ug/l)	15	0	0	0.0078	0.0078	***15***
Cr^{+6}, Dis (ug/l)	1.7	0	0	0.0078	0.0078	***1.7***
Cu, Dis (ug/l)	4.4	0	0	0.0078	0.0078	***4.4***
CN, Free (ug/l)	0.75	0	0	0.0078	0.0078	***0.75***
Fe, Trec (ug/l)	1000	0	0	0.0078	0.0078	***1,000***
Pb, Dis (ug/l)	2.7	0	0	0.0078	0.0078	***2.7***
Mn, Dis (ug/l)	1339	0	0	0.0078	0.0078	***1,339***
Hg, Tot (ug/l)	0	0	0	0.0078	0.0078	-
Ni, Dis (ug/l)	25	0	0	0.0078	0.0078	***25***
Se, Dis (ug/l)	0.69	0	0	0.0078	0.0078	***0.69***
Ag, Dis (ug/l)	0.53	0	0	0.0078	0.0078	***0.53***
Zn, Dis (ug/l)	382	0	0	0.0078	0.0078	***382***

Table A-39
SCTs and ADBACs for the Santa Cruz Adit

Pollutant	*SCT*	M_1	Q_1 *(cfs)*	Q_2 *(cfs)*	Q_3 *(cfs)*	*ADBAC*
As, Trec (ug/l)	15	0	0	0.049	0.049	***15***
Cd, Dis (ug/l)	3.0	0	0	0.049	0.049	***3.0***
Cr^{+3}, Trec (ug/l)	15	0	0	0.049	0.049	***15***
Cr^{+6}, Dis (ug/l)	1.7	0	0	0.049	0.049	***1.7***
Cu, Dis (ug/l)	18	0	0	0.049	0.049	***18***
CN, Free (ug/l)	0.75	0	0	0.049	0.049	***0.75***
Fe, Trec (ug/l)	344	0	0	0.049	0.049	***344***
Pb, Dis (ug/l)	1.7	0	0	0.049	0.049	***1.7***
Mn, Dis (ug/l)	607	0	0	0.049	0.049	***607***
Hg, Tot (ug/l)	0	0	0	0.049	0.049	-
Ni, Dis (ug/l)	25	0	0	0.049	0.049	***25***
Se, Dis (ug/l)	0.69	0	0	0.049	0.049	***0.69***
Ag, Dis (ug/l)	0.54	0	0	0.049	0.049	***0.54***
Zn, Dis (ug/l)	382	0	0	0.049	0.049	***382***

Table A-40
SCTs and ADBACs for the Argentine Seep

Pollutant	*SCT*	M_1	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	*ADBAC*
As, Trec (ug/l)	7.5	0	0	0.11	0.11	*7.5*
Cd, Dis (ug/l)	2.0	0	0	0.11	0.11	*2.0*
Cr^{+3}, Trec (ug/l)	7.5	0	0	0.11	0.11	*7.5*
Cr^{+6}, Dis (ug/l)	1.7	0	0	0.11	0.11	*1.7*
Cu, Dis (ug/l)	4.4	0	0	0.11	0.11	*4.4*
CN, Free (ug/l)	0.75	0	0	0.11	0.11	*0.75*
Fe, Trec (ug/l)	469	0	0	0.11	0.11	*469*
Pb, Dis (ug/l)	3.8	0	0	0.11	0.11	*3.8*
Mn, Dis (ug/l)	2618	0	0	0.11	0.11	*2,618*
Hg, Tot (ug/l)	0	0	0	0.11	0.11	-
Ni, Dis (ug/l)	25	0	0	0.11	0.11	*25*
Se, Dis (ug/l)	0.69	0	0	0.11	0.11	*0.69*
Ag, Dis (ug/l)	0.53	0	0	0.11	0.11	*0.53*
Zn, Dis (ug/l)	382	0	0	0.11	0.11	*382*

Table A-41
SCTs and ADBACs for the Columbia Tailings Seep

Pollutant	*SCT*	M_1	Q_1 (cfs)	Q_2 (cfs)	Q_3 (cfs)	*ADBAC*
As, Trec (ug/l)	15	0	0	0.053	0.053	*15*
Cd, Dis (ug/l)	6.2	0	0	0.053	0.053	*6.2*
Cr^{+3}, Trec (ug/l)	15	0	0	0.053	0.053	*15*
Cr^{+6}, Dis (ug/l)	1.7	0	0	0.053	0.053	*1.7*
Cu, Dis (ug/l)	29	0	0	0.053	0.053	*29*
CN, Free (ug/l)	0.75	0	0	0.053	0.053	*0.75*
Fe, Trec (ug/l)	469	0	0	0.053	0.053	*469*
Pb, Dis (ug/l)	2.9	0	0	0.053	0.053	*2.9*
Mn, Dis (ug/l)	2203	0	0	0.053	0.053	*2,203*
Hg, Tot (ug/l)	0	0	0	0.053	0.053	-
Ni, Dis (ug/l)	25	0	0	0.053	0.053	*25*
Se, Dis (ug/l)	3.1	0	0	0.053	0.053	*3.1*
Ag, Dis (ug/l)	0.53	0	0	0.053	0.053	*0.53*
Zn, Dis (ug/l)	382	0	0	0.053	0.053	*382*

ADBACs for the St. Louis Ponds were evaluated based on calculations of seasonal ADBACs, which were then compared to the corresponding seasonal assimilative capacities. However, it is the procedure of the WQCD to impose the average concentration of all the seasonal ADBACs when establishing a permit limitation. Therefore, the average of the seasonal ADBACs for the St. Louis Ponds are set forth in Table A-42.

Table A-42
Average of the Seasonal ADBACs for the St. Louis Ponds

Pollutant	*Average ADBAC*
As, Trec (ug/l)	39
Cd, Dis (ug/l)	6.6
Cr^{+3}, Trec (ug/l)	NA
Cr^{+6}, Dis (ug/l)	4.6
Cu, Dis (ug/l)	5.5
CN, Free (ug/l)	1.7
Fe, Trec (ug/l)	833
Pb, Dis (ug/l)	2.1
Mn, Dis (ug/l)	2,072
Hg, Tot (ug/l)	-
Ni, Dis (ug/l)	34
Se, Dis (ug/l)	1.8
Ag, Dis (ug/l)	0.41
Zn, Dis (ug/l)	483

VI. Preliminary Permit Limitations

Permit limitations are established based on the most stringent of the WQBELs and technology-based effluent limitations. Because there are no ongoing mining activities or ore dressing activities, the effluent limitations guidelines (ELGs) contained in 40 CFR Part 440 (Ore Mining and Dressing Point Source Category) do not apply. It is currently the approach of the WQCD to apply ELGs on a case-by-case basis, only in the event that the WQBELs are determined to be insufficient. For purposes of this analysis, the WQBELs are sufficient and therefore technology-based effluent limitations are not applied to any of the point source dischargers.

ADBACs are also applied unless the following conditions are met:

- The dischargers accept the permit limits based on the current permitted load, which in this case is zero and therefore not realistic.
- The dischargers conduct an alternatives analysis that demonstrates that meeting ADBACs is not feasible. This has not been conducted.

The preliminary permit limitations are therefore based on the WQBELs and ADBACs. These are set forth in Table A-43 for Scenario 1 and in Table A-44 for Scenario 2. It should be noted that it is the

WQCD's procedure to provide an effective date of two years after permit issuance for ADBAC-based limitations.

Table A-43
Preliminary Effluent Limitations for Scenario 1

Parameter	*St. Louis Ponds Limits (Jan-Mar)*	*St. Louis Ponds Limits (Apr-Sep)*	*St. Louis Ponds Limits (Oct-Dec)*	*Blaine Adit Limits*	*Argentine Seep Limits*	*Columbia Tailings Seep Limits*	*Rico Boy Adit Limits*	*Santa Cruz Adit Limits*	*Silver Swan Adit Limits*
As, Trec daily max. (ug/l)	NA	NA	NA	NA	50	NA	NA	NA	NA
As, Trec 30-day avg. (ug/l)	286	413	264	5832	50	100	100	100	100
As, Trec 2-year avg. (ug/l)	39	39	39	NA	7.5	15	15	15	29
Cd, Dis daily max. (ug/l)	15	28	14	-4	17	19	19	19	19
Cd, Dis 30-day avg. (ug/l)	8.0	12	7.5	-73	3.3	6.2	6.2	6.2	6.2
Cd, Dis 2-year avg. (ug/l)	6.6	6.6	6.6	NA	2.0	6.2	6.2	3.0	1.8
Cr^{+3}, Trec daily max.	NA	NA	NA	NA	50	NA	NA	NA	NA
(ug/l) Trec 30-day avg.	285	411	264	5852	50	100	100	100	100
(ug/l) Trec 2-year avg.	NA	NA	NA	NA	7.5	15	15	15	15
(ug/l) Dis daily max. (ug/l)	37	65	34	598	16	16	16	16	16
Cr^{+6}, Dis 30-day avg. (ug/l)	31	45	29	644	11	11	11	11	11
Cr^{+6}, Dis 2-year avg. (ug/l)	4.6	4.6	4.6	NA	1.7	1.7	1.7	1.7	1.7
Cu, Dis daily max. (ug/l)	46	85	42	62	50	50	50	50	50
Cu, Dis 30-day avg. (ug/l)	36	54	33	-102	29	29	29	29	29
Cu, Dis 2-year avg. (ug/l)	5.5	5.5	5.5	NA	4.4	29	4.4	18	4.4
CN, Free daily max. (ug/l)	12	20	11	187	5.0	5.0	5.0	5.0	5.0
CN, Free 2-year avg. (ug/l)	1.7	1.7	1.7	NA	0.75	0.75	0.75	0.75	0.75
Fe, Trec 30-day avg. (ug/l)	1215	1642	1183	3630	1000	1000	1000	1000	1000
Fe, Trec 2-year avg. (ug/l)	833	833	833	NA	469	469	1000	344	1000
Pb, Dis daily max. (ug/l)	236	447	215	1864	281	281	281	281	281
Pb, Dis 30-day avg. (ug/l)	9.4	15	8.8	-61	10	11	11	11	11
Pb, Dis 2-year avg. (ug/l)	2.1	2.1	2.1	NA	3.8	2.9	2.7	1.7	6.2
Mn, Dis daily max. (ug/l)	7509	13247	6859	100308	4738	4738	4738	4738	4738
Mn, Dis 30-day avg. (ug/l)	4745	6873	4420	83372	2618	2618	2618	2618	2618
Mn, Dis 2-year avg. (ug/l)	2072	2072	2072	NA	2618	2203	1339	607	1457
Hg, Tot 30-day avg. (ug/l)	0.028	0.041	0.026	0.59	0.010	0.010	0.010	0.010	0.010
Hg, Tot 2-year avg. (ug/l)	-	-	-	NA	-	-	-	-	0.010
Ni, Dis daily max. (ug/l)	1565	2910	1423	15076	1513	1513	1513	1513	1513
Ni, Dis 30-day avg. (ug/l)	215	325	199	2607	168	168	168	168	168
Ni, Dis 2-year avg. (ug/l)	34	34	34	NA	25	25	25	25	25
Se, Dis daily max. (ug/l)	42	73	38	687	18	18	18	18	18
Se, Dis 30-day avg. (ug/l)	12	17	11	269	4.6	4.6	4.6	4.6	4.6
Se, Dis 2-year avg. (ug/l)	1.8	1.8	1.8	NA	0.69	3.1	0.69	0.69	0.69
Ag, Dis daily max. (ug/l)	8.5	18	7.7	56	18	22	22	22	22
Ag, Dis 30-day avg. (ug/l)	1.2	2.0	1.1	3.3	0.81	3.5	3.5	3.5	3.5
Ag, Dis 2-year avg. (ug/l)	0.41	0.41	0.41	NA	0.53	0.53	0.53	0.54	0.53
Zn, Dis daily max. (ug/l)	249	616	227	11428	379	379	379	379	379
Zn, Dis 30-day avg. (ug/l)	330	620	309	-4800	316	382	382	382	382
Zn, Dis 2-year avg. (ug/l)	483	483	483	NA	382	382	382	382	382

Table A-44
Preliminary Effluent Limitations for Scenario 2

Parameter	*St. Louis Ponds Limits (Jan-Mar)*	*St. Louis Ponds Limits (Apr-Sep)*	*St. Louis Ponds Limits (Oct-Dec)*	*Blaine Adit Limits*	*Argentine Seep Limits*	*Columbia Tailings Seep Limits*	*Rico Boy Adit Limits*	*Santa Cruz Adit Limits*	*Silver Swan Adit Limits*
As, T rec daily max. (ug/l)	NA	NA	NA	0	50	NA	NA	NA	NA
As, T rec 30-day avg. (ug/l)	296	419	273	0	50	100	100	100	100
As, T rec 2-year avg. (ug/l)	39	39	39	0	7.5	15	15	15	29
Cd, Dis daily max. (ug/l)	15	29	14	0	17	19	19	19	19
Cd, Dis 30-day avg. (ug/l)	8.4	13	7.8	0	5.5	6.2	6.2	6.2	6.2
Cd, Dis 2-year avg. (ug/l)	6.6	6.6	6.6	0	2.0	6.2	6.2	3.0	1.8
Cr^{+3}, T rec daily max. (ug/l)	NA	NA	NA	0	50	NA	NA	NA	NA
Cr^{+3}, T rec 30-day avg. (ug/l)	295	417	272	0	50	100	100	100	100
Cr^{+3}, T rec 2-year avg. (ug/l)	NA	NA	NA	0	7.5	15	15	15	15
Cr^{+6}, Dis daily max. (ug/l)	38	66	35	0	16	16	16	16	16
Cr^{+6}, Dis 30-day avg. (ug/l)	32	46	30	0	11	11	11	11	11
Cr^{+6}, Dis 2-year avg. (ug/l)	4.6	4.6	4.6	0	1.7	1.7	1.7	1.7	1.7
Cu, Dis daily max. (ug/l)	46	85	42	0	50	50	50	50	50
Cu, Dis 30-day avg. (ug/l)	36	54	34	0	29	29	29	29	29
Cu, Dis 2-year avg. (ug/l)	5.5	5.5	5.5	0	4.4	29	4.4	18	4.4
CN, Free daily max. (ug/l)	12	21	11	0	5.0	5.0	5.0	5.0	5.0
CN, Free 2-year avg. (ug/l)	1.7	1.7	1.7	0	0.75	0.75	0.75	0.75	0.75
Fe, T rec 30-day avg. (ug/l)	1221	1646	1189	0	1000	1000	1000	1000	1000
Fe, T rec 2-year avg. (ug/l)	833	833	833	0	469	469	1000	344	1000
Pb, Dis daily max. (ug/l)	240	450	218	0	281	281	281	281	281
Pb, Dis 30-day avg. (ug/l)	10	16	9.3	0	11	11	11	11	11
Pb, Dis 2-year avg. (ug/l)	2.1	2.1	2.1	0	3.8	2.9	2.7	1.7	6.2
Mn, Dis daily max. (ug/l)	8165	14376	7427	0	4738	4738	4738	4738	4738
Mn, Dis 30-day avg. (ug/l)	5517	7985	5107	0	2618	2618	2618	2618	2618
Mn, Dis 2-year avg. (ug/l)	2072	2072	2072	0	2618	2203	1339	607	1457
Hg, Tot 30-day avg. (ug/l)	0.029	0.042	0.027	0	0.010	0.010	0.010	0.010	0.010
Hg, Tot 2-year avg. (ug/l)	-	-	-	0	-	-	-	-	0.010
Ni, Dis daily max. (ug/l)	1590	2926	1446	0	1513	1513	1513	1513	1513
Ni, Dis 30-day avg. (ug/l)	220	328	203	0	168	168	168	168	168
Ni, Dis 2-year avg. (ug/l)	34	34	34	0	25	25	25	25	25
Se, Dis daily max. (ug/l)	43	74	39	0	18	18	18	18	18
Se, Dis 30-day avg. (ug/l)	12	18	12	0	4.6	4.6	4.6	4.6	4.6
Se, Dis 2-year avg. (ug/l)	1.8	1.8	1.8	0	0.69	3.1	0.69	0.69	0.69
Ag, Dis daily max. (ug/l)	8.9	19	8.1	0	20	22	22	22	22
Ag, Dis 30-day avg. (ug/l)	1.9	3.0	1.7	0	0.81	3.5	3.5	3.5	3.5
Ag, Dis 2-year avg. (ug/l)	0.41	0.41	0.41	0	0.53	0.53	0.53	0.54	0.53
Zn, Dis daily max. (ug/l)	268	628	245	0	379	379	379	379	379
Zn, Dis 30-day avg. (ug/l)	334	622	313	0	382	382	382	382	382
Zn, Dis 2-year avg. (ug/l)	483	483	483	0	382	382	382	382	382

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Personal Communication between Chris Kramer (Town of Rico) and Regina Meehan (FABL Environmental Regulatory Specialists, Inc.)

Personal Communication between the (local Water Commissioner) and Regina Meehan (FABL Environmental Regulatory Specialists, Inc.)